

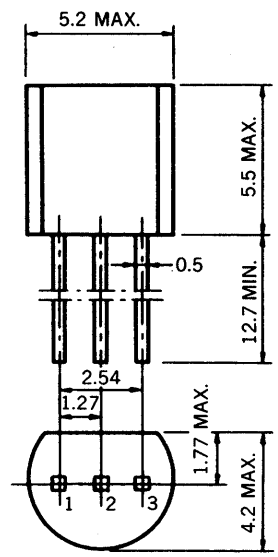
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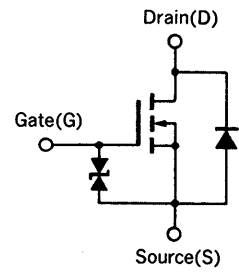
# MOS FIELD EFFECT TRANSISTOR 2SK679A

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

### PACKAGE DIMENSIONS (Unit : mm)



- 1. Gate (G)
- 2. Drain (D)
- 3. Source (S)



(Diode in the figure is the parasitic diode.)

The 2SK679A, N-channel vertical type MOS FET, is a switching device which can be directly driven from an IC operating with a 5 V single power supply. The device featuring low ON-state resistance is of the voltage drive type and thus is ideal for driving actuators such as motors, solenoids, and relays.

### FEATURES

- Low ON-state resistance  
 $R_{DS(on)} = 1.0 \Omega$  MAX. at  $V_{GS} = 4.0$  V,  $I_D = 0.5$  A  
 $R_{DS(on)} = 0.7 \Omega$  MAX. at  $V_{GS} = 10$  V,  $I_D = 0.5$  A
- Voltage drive at logic level ( $V_{GS} = 4$  V) is possible.
- Bidirectional zener diode for protection is incorporated in between the gate and the source.
- Inductive loads can be driven without protective circuit thanks to the improved breakdown voltage between the 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.

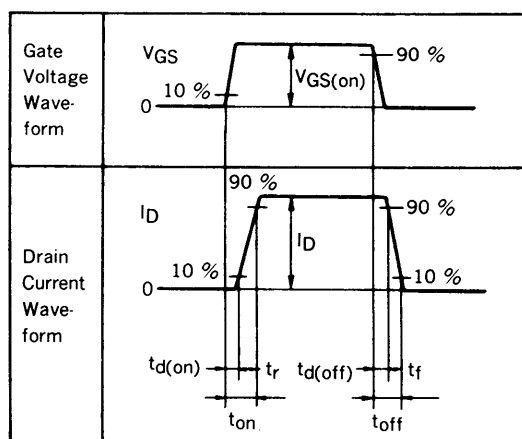
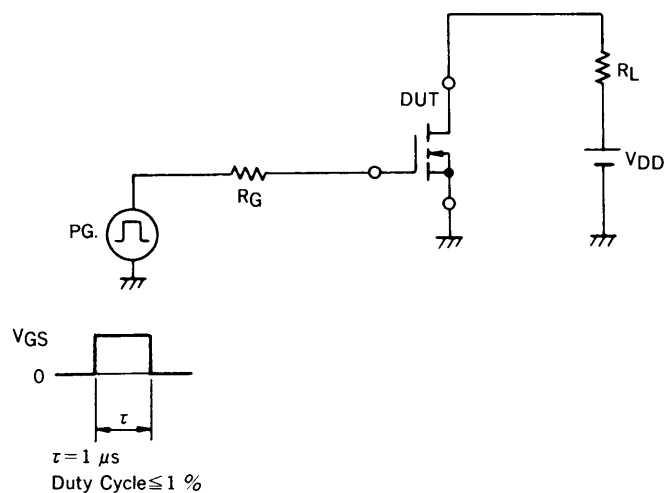
### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT	TEST CONDITIONS
Drain to Source Voltage	$V_{DSS}$	30	V	$V_{GS} = 0$
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V	$V_{DS} = 0$
Drain Current (DC)	$I_{D(DC)}$	$\pm 0.5$	A	
Drain Current (pulse)	$I_{D(pulse)}$	$\pm 1.5$	A	$PW \leq 10$ ms, Duty Cycle $\leq 50$ %
Total Power Dissipation	$P_T$	750	mW	
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

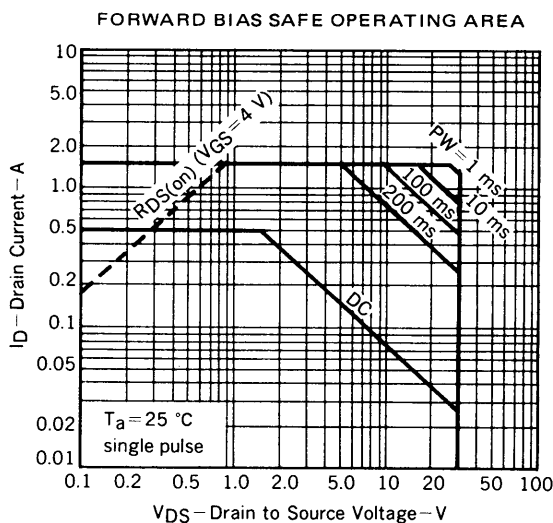
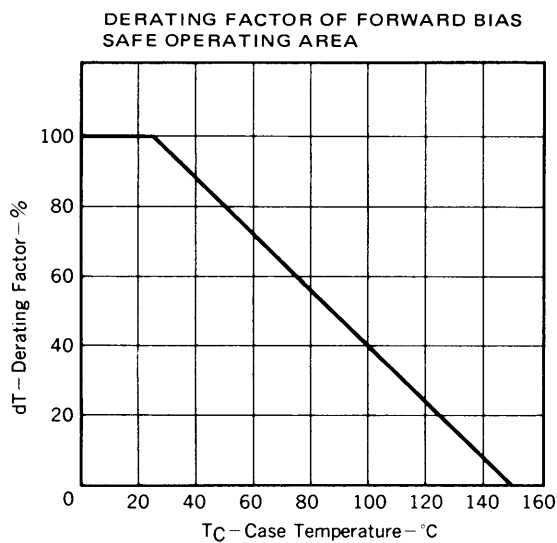
ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I <sub>DSS</sub>			10	μA	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0
Gate Leakage Current	I <sub>GSS</sub>			±10	μA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0
Gate Cut-off Voltage	V <sub>GS(off)</sub>	1.0	1.6	2.5	V	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA
Forward Transfer Admittance	Y <sub>fs</sub>	0.4			S	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.5 A
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>		0.6	1.0	Ω	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 0.5 A
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>		0.4	0.7	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.5 A
Input Capacitance	C <sub>iss</sub>		130		pF	V <sub>DS</sub> = 5.0 V, V <sub>GS</sub> = 0, f = 1 MHz
Output Capacitance	C <sub>oss</sub>		70		pF	
Feedback Capacitance	C <sub>rss</sub>		30		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		12		ns	V <sub>GS(on)</sub> = 10 V, R <sub>G</sub> = 10 Ω V <sub>DD</sub> = 25 V, I <sub>D</sub> = 0.5 A R <sub>L</sub> = 50 Ω
Rise Time	t <sub>r</sub>		44		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		310		ns	
Fall Time	t <sub>f</sub>		160		ns	

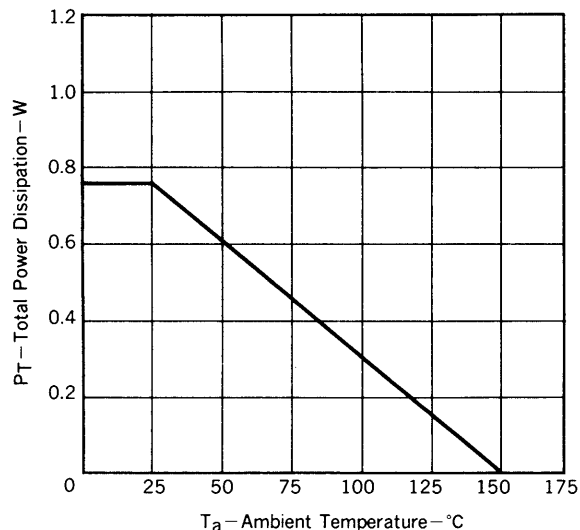
SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS



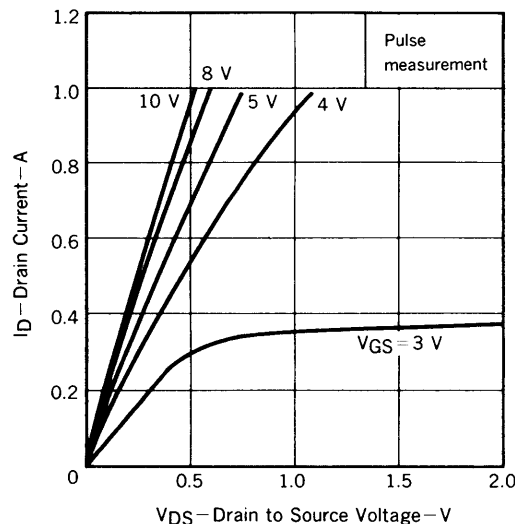
TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)



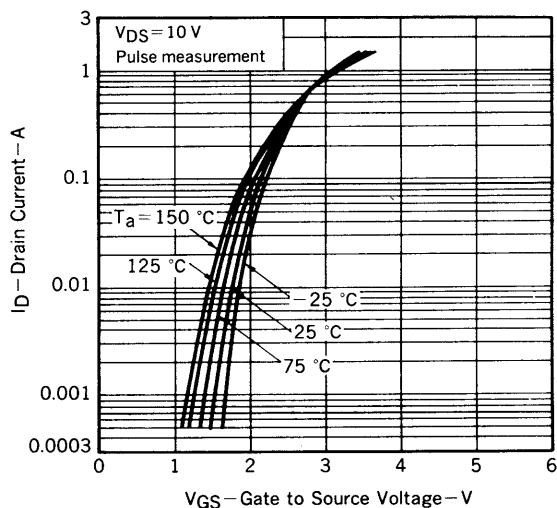
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



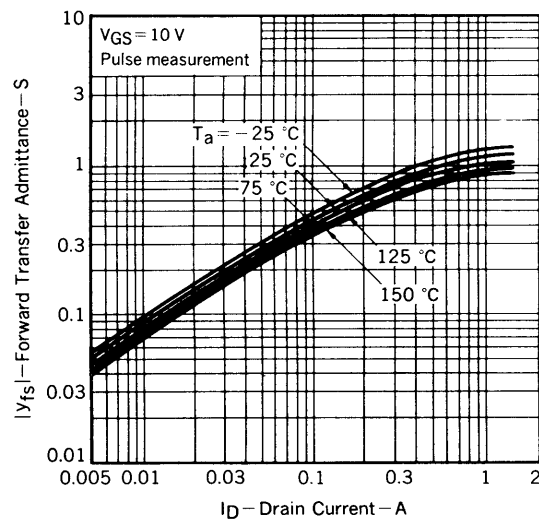
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



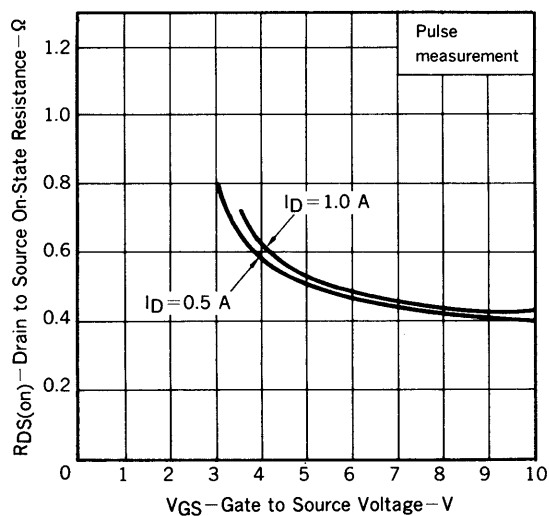
TRANSFER CHARACTERISTICS



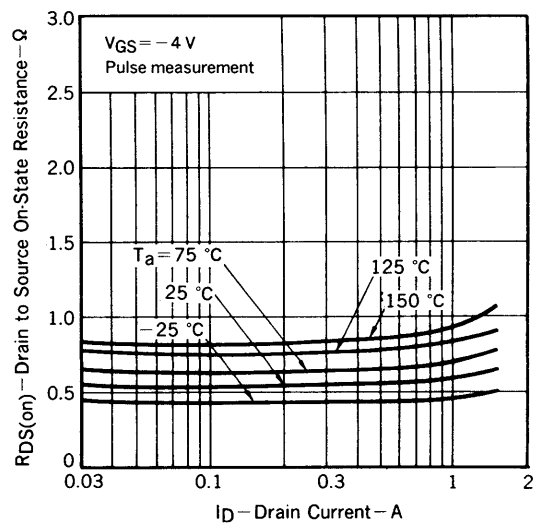
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



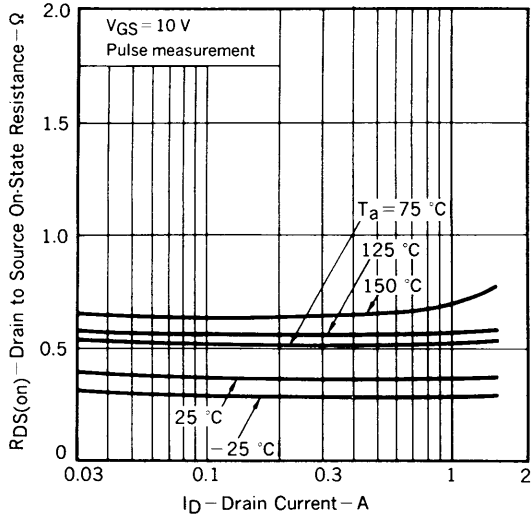
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



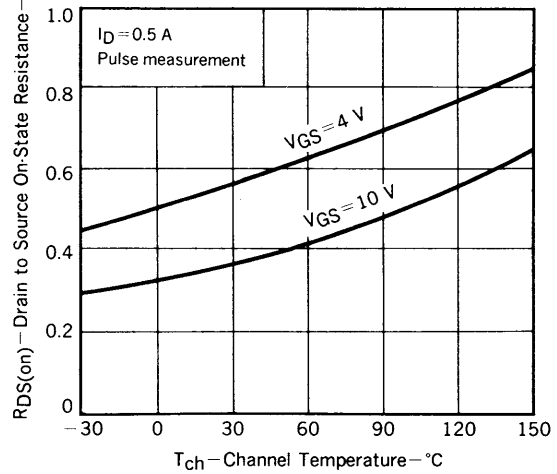
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



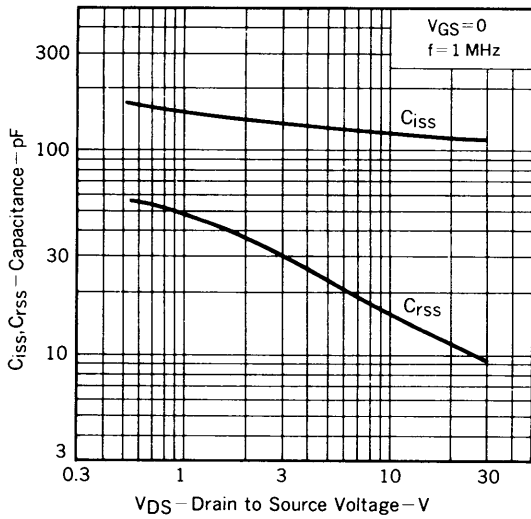
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



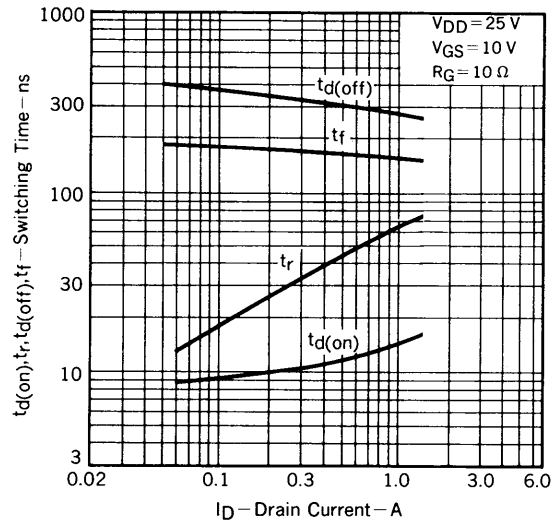
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



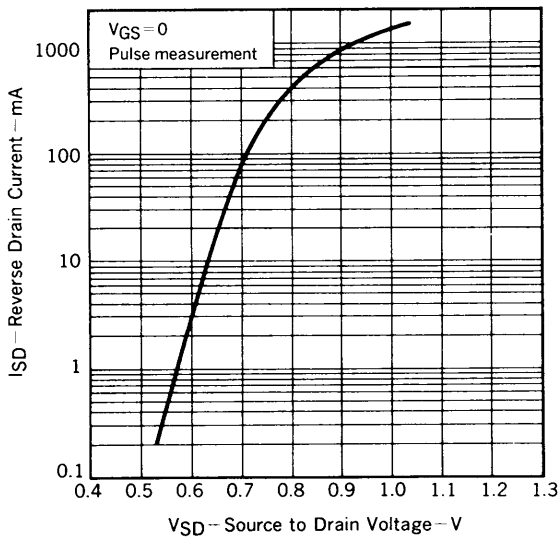
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



**RECOMMENDED SOLDERING CONDITIONS**

Solder this product under the following recommended conditions.

For soldering methods or soldering conditions other than those recommended in the table, please consult our NEC salespeople.

**Insert type**

Soldering method	Soldering conditions	Recommended condition code
Wave soldering	Solder bath temperature: 260 °C max. Soldering time: 10 sec max.	

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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.