

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Not recommended  
for new design

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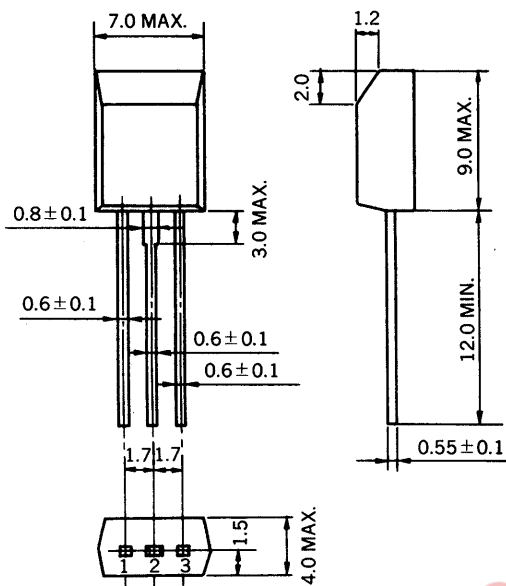
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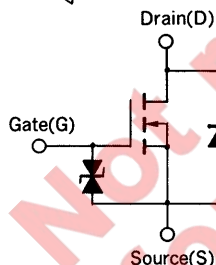
# MOS FIELD EFFECT TRANSISTOR 2SK1274

## N-CHANNEL MOS FET FOR HIGH SPEED SWITCHING

**PACKAGE DIMENSIONS (Unit : mm)**



- 1. Gate
- 2. Drain
- 3. Source



(Diode in the figure is the parasitic diode.)

The 2SK1274, 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.

The MOS FET has excellent switching characteristics and is suitable for use as a high-speed switching device in digital circuits.

**FEATURES**

- Directly driven by ICs having a 5 V power source.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.
- Low ON-state resistance

$$R_{DS(on)} = 1.00 \Omega \text{ TYP. at } V_{GS} = 4 \text{ V, } I_D = 0.5 \text{ A}$$

$$R_{DS(on)} = 0.65 \Omega \text{ TYP. at } V_{GS} = 10 \text{ V, } I_D = 0.5 \text{ A}$$

**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.

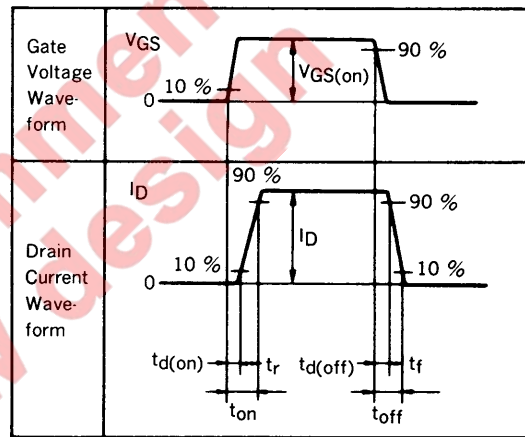
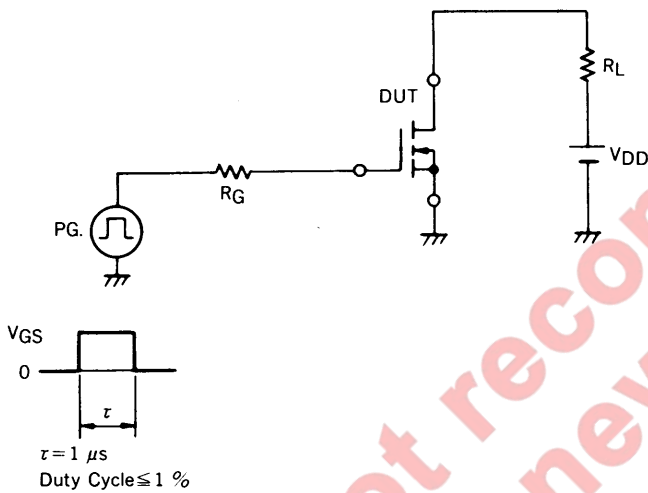
**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

PARAMETER	SYMBOL	RATINGS	UNIT	TEST CONDITIONS
Drain to Source Voltage	$V_{DSS}$	60	V	$V_{GS} = 0$
Gate to Source Voltage	$V_{GSS}$	$\pm 20$	V	$V_{DS} = 0$
Drain Current	$I_D(DC)$	$\pm 1.5$	A	
Drain Current	$I_D(pulse)$	$\pm 3.0$	A	$PW \leq 10 \text{ ms, Duty Cycle} \leq 50 \%$
Total Power Dissipation	$P_T$	1.0	W	
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)

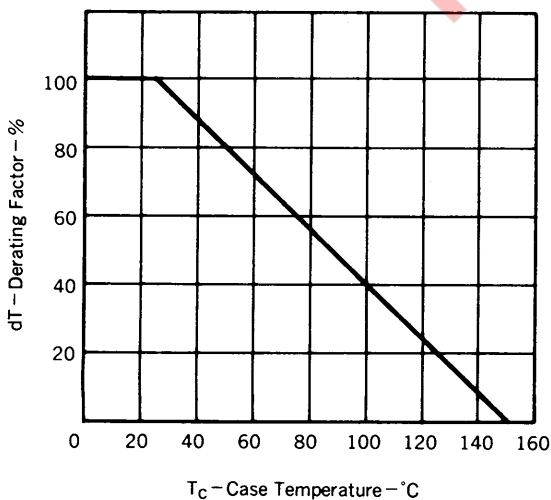
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I <sub>DSS</sub>			10	μA	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0
Gate Leakage Current	I <sub>GSS</sub>			±10	μA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0
Gate Cut-off Voltage	V <sub>GS(off)</sub>	1.0	1.7	2.5	V	V <sub>DS</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>		0.31	1.00	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>		0.24	0.65	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.5 A
Input Capacitance	C <sub>iss</sub>		220		pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1 MHz
Output Capacitance	C <sub>oss</sub>		105		pF	
Feedback Capacitance	C <sub>rss</sub>		16		pF	
Turn-On Delay Time	t <sub>d(on)</sub>		15		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>		35		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		380		ns	
Fall Time	t <sub>f</sub>		120		ns	

SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS

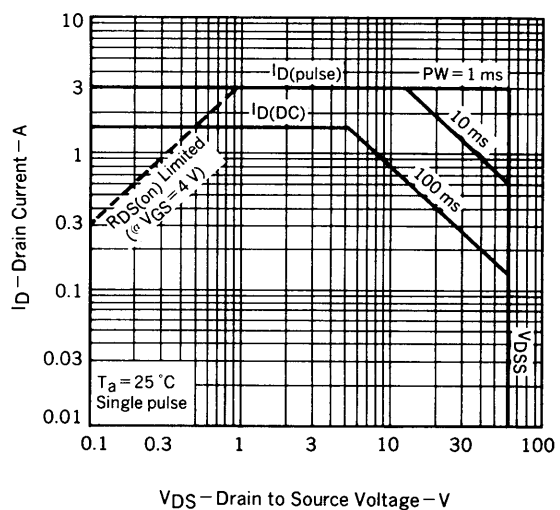


TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

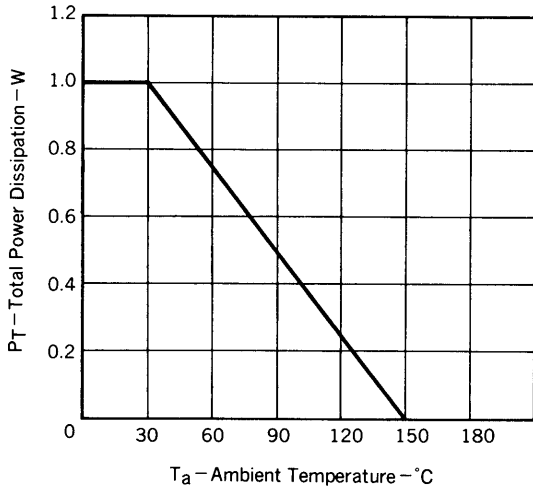
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



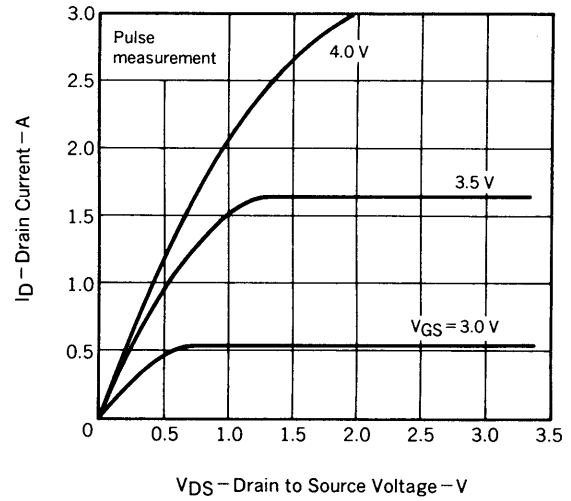
FORWARD BIAS SAFE OPERATING AREA



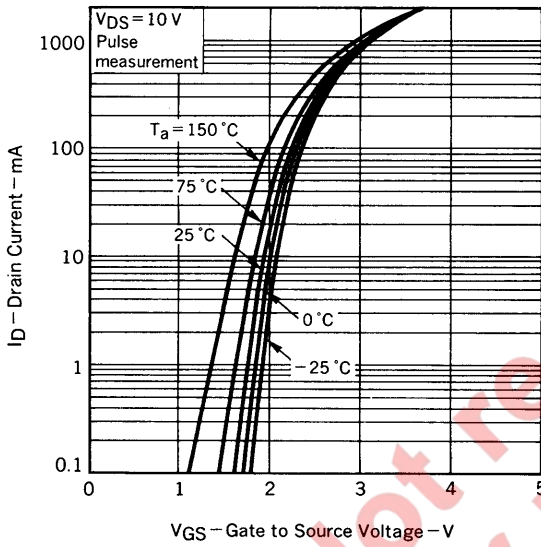
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



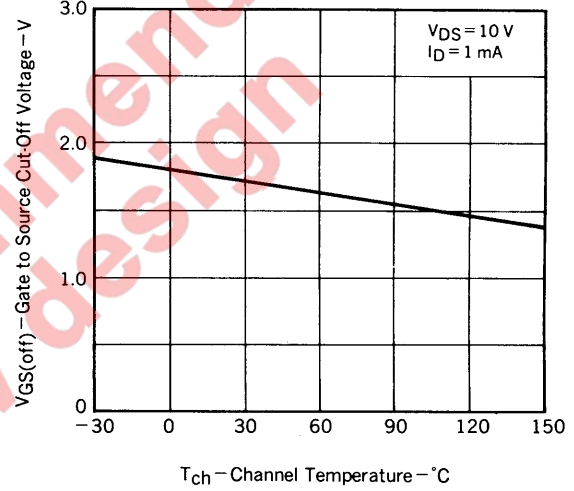
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



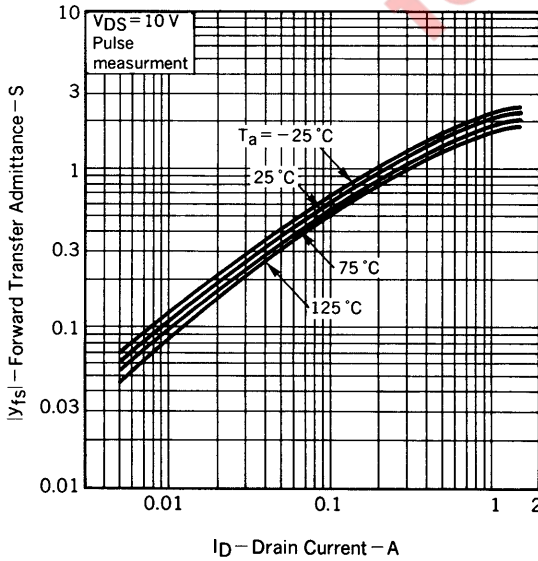
TRANSFER CHARACTERISTICS



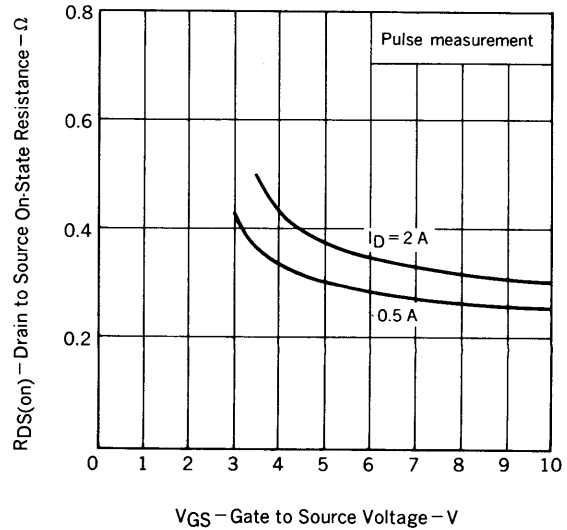
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE

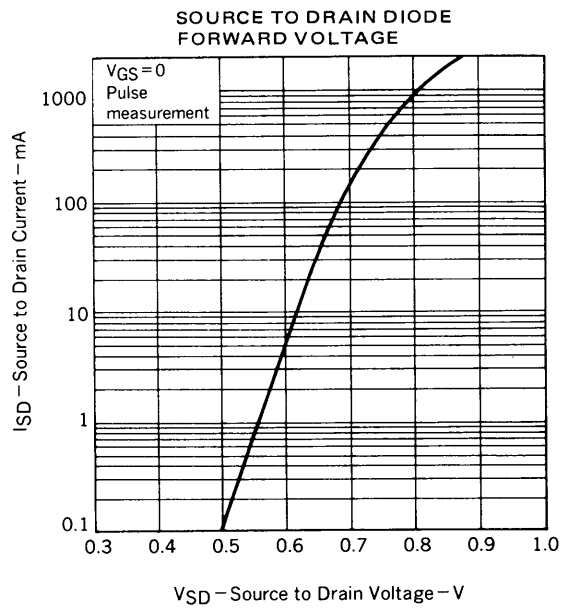
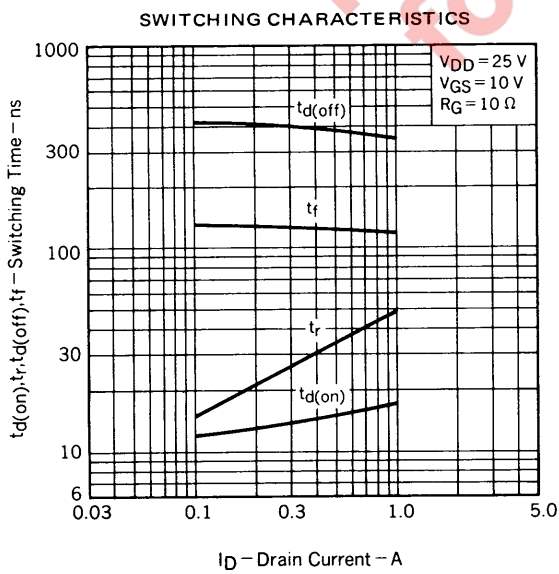
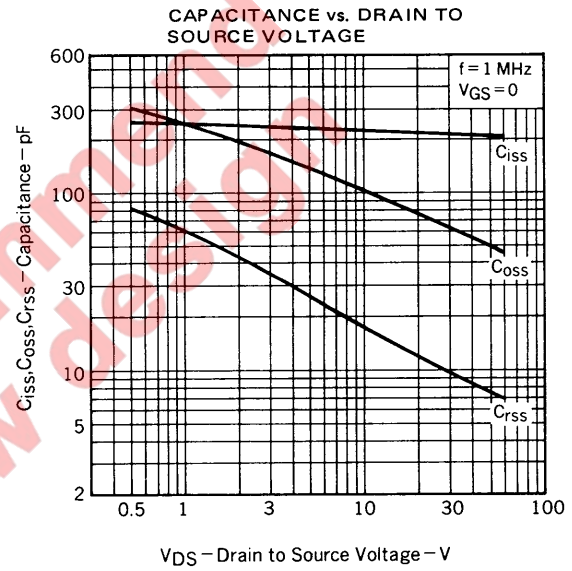
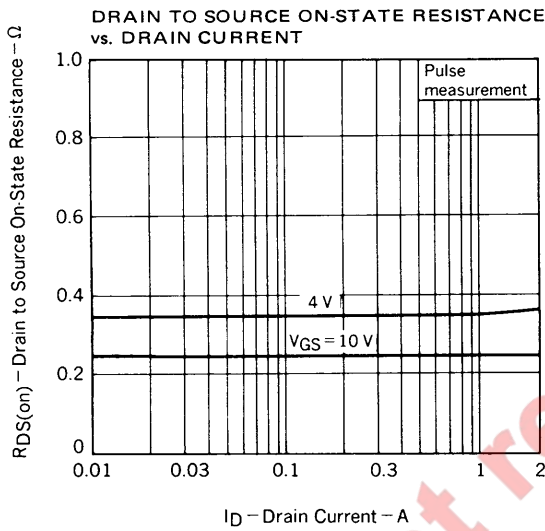
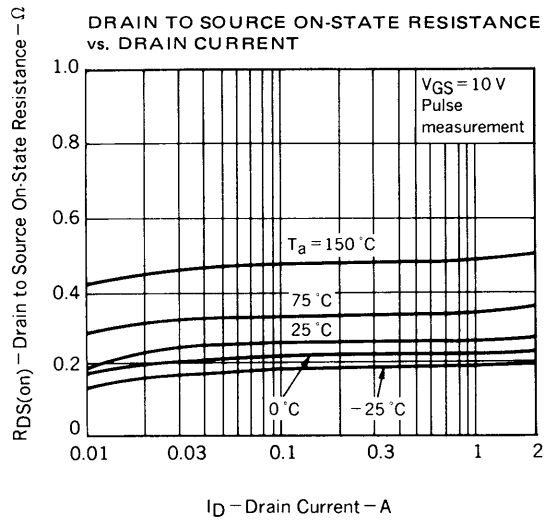
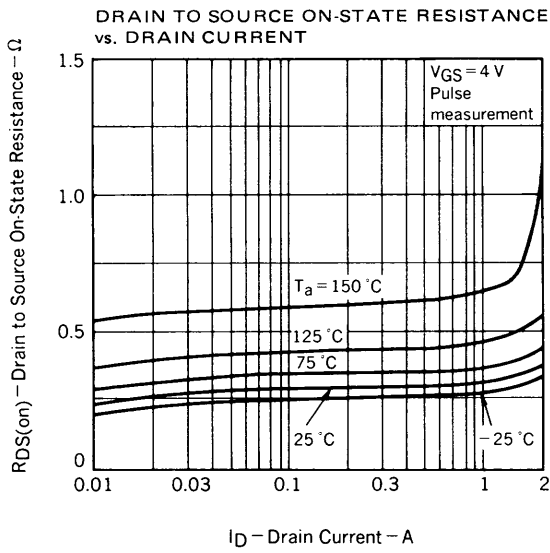


FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



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





**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.	

**Not recommend  
for new design**

(MEMO)

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Application examples recommended by NEC Corporation

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Special: Automotive and Transportation equipment, Communication equipment (trunk line), Train and Traffic control devices, industrial robots, Burning control systems, antidisaster systems, anticrime systems etc.