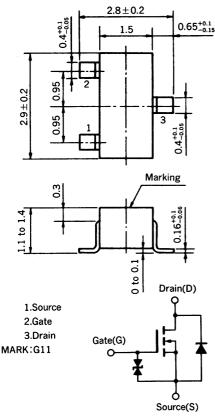
# MOS FIELD EFFECT TRANSISTOR **2SK1133**

# N-CHANNEL MOS FET FOR HIGH SPEED SWITCHING

# PACKAGE DIMENSIONS (Unit: mm)



(Diode in the figure is the parasitic diode.)

The 2SK1133, 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.
- Can be used complementary with the 2SJ166.

### **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.

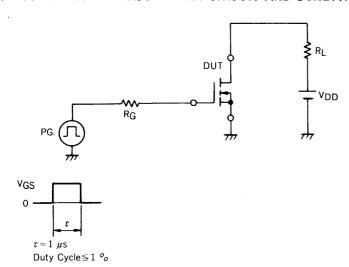
# ABSOLUTE MAXIMUM RATINGS ( $T_a = 25$ °C)

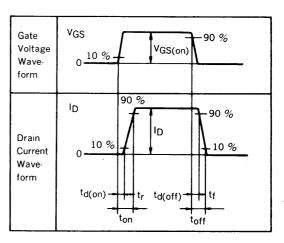
PARAMETER	SYMBOL	RATINGS	UNIT	TEST CONDITIONS	
Drain to Source Voltage	V <sub>DSS</sub>	50	V	V <sub>GS</sub> = 0	
Gate to Source Voltage	VGSS	±7.0	V	V <sub>DS</sub> = 0	
Drain Current	ID(DC)	±100	mA		
Drain Current	ID(pulse)	±200	mA	PW ≦ 10 ms, Duty Cycle ≦ 50 %	
Total Power Dissipation	PT	200	mW		
Channel Temperature	T <sub>ch</sub>	150	°C		
Storage Temperature	T <sub>stg</sub>	55 to +150	°c		

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

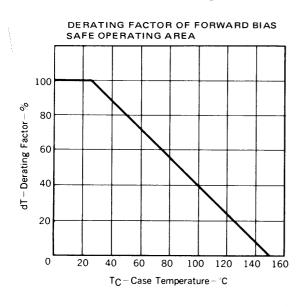
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Drain Cut-off Current	IDSS			10	μА	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0	
Gate Leakage Current	IGSS			±10	μА	V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0	
Gate Cut-off Voltage	V <sub>GS</sub> (off)	1.0	1.7	2.0	V	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 1.0 μA	
Forward Transfer Admittance	lyfs l	20	40		mS	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 20 mA	
Drain to Source On-State Resistance	R <sub>DS</sub> (on)		16	50	Ω	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 20 mA	
Input Capacitance	C <sub>iss</sub>		7		pF	V <sub>DS</sub> = 5.0 V, V <sub>GS</sub> = 0, f = 1 MHz	
Output Capacitance	Coss		6		pF		
Feedback Capacitance	C <sub>rss</sub>		2		pF		
Turn-On Delay Time	td(on)		6		ns	$V_{GS(on)}$ = 5.0 V, $R_{G}$ = 10 $\Omega$ $V_{DD}$ = 5.0 V, $I_{D}$ = 20 mA $R_{L}$ = 250 $\Omega$	
Rise Time	t <sub>r</sub>		25		ns		
Turn-Off Delay Time	<sup>t</sup> d(off)		36		ns		
Fall Time	tf		35		ns		

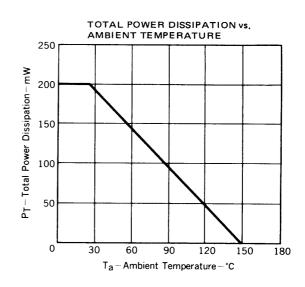
# SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS

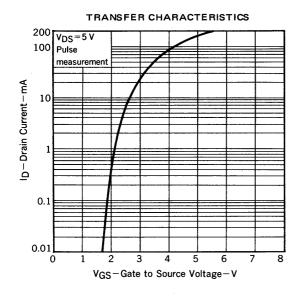


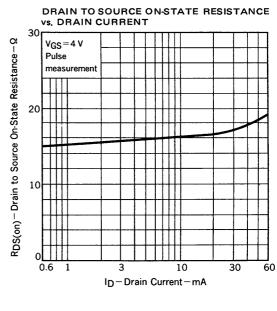


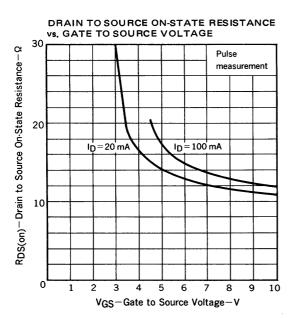
# TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

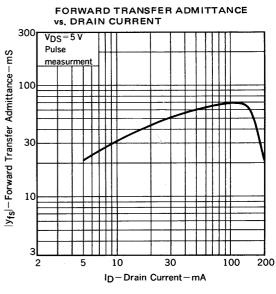


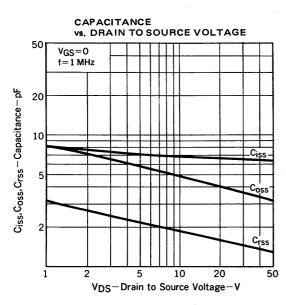


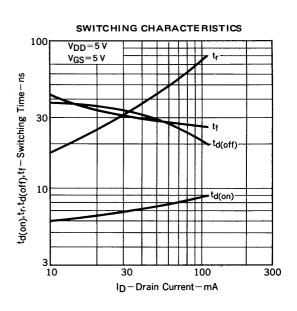


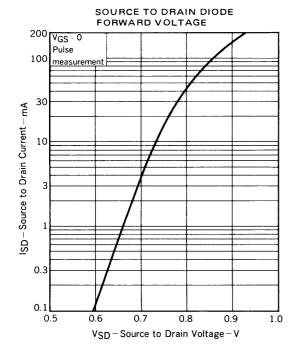












# RECOMMENDED SOLDERING CONDITIONS

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 IR30-00		
Infrared Reflow	Package peak temp.: 230 °C Soldering time: within 30 sec (above 210 °C) Soldering times: 1, Days limitation: none*			
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		

<sup>\*:</sup> 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 recomended 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.