

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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EOL announced Product

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SWITCHING  
N-CHANNEL MOS FET

DESCRIPTION

The 2SK1581, N-channel vertical type MOS FET, can be driven by 2.5 V power supply.

As the 2SK1581 is driven by low voltage and does not require consideration of driving current, it is suitable for appliances including VCR cameras and headphone stereos which need power saving.

FEATURES

- Directly driven by ICs having a 3 V power supply.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.

★ ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1581	SC-59 (Mini Mold)

Marking: G14

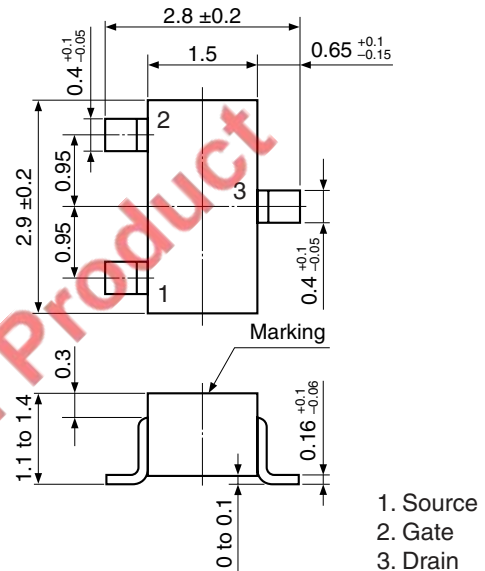
★ ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Drain to Source Voltage (VGS = 0 V)	V <sub>DSS</sub>	16	V
Gate to Source Voltage (V <sub>DS</sub> = 0 V)	V <sub>GSS</sub>	±16	V
Drain Current (DC)	I <sub>D(DC)</sub>	±200	mA
Drain Current (pulse) <small>Note</small>	I <sub>D(pulse)</sub>	±400	mA
Total Power Dissipation	P <sub>T</sub>	200	mW
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

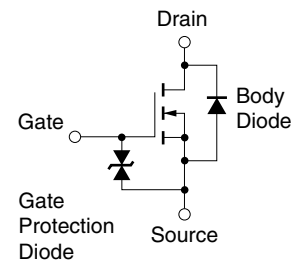
**Note** PW ≤ 10 ms, Duty Cycle ≤ 50%

- ★ **Remark** The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



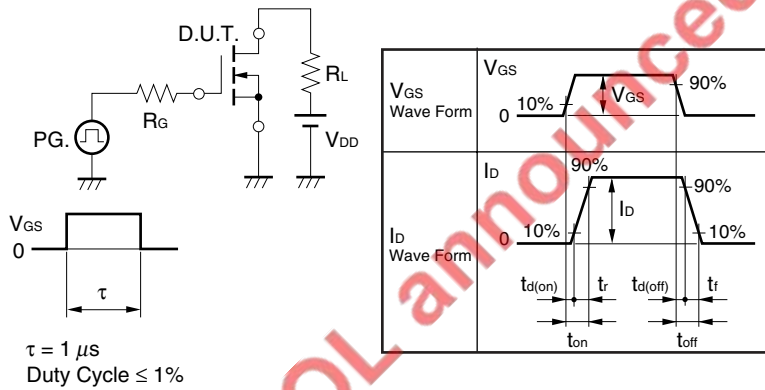
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

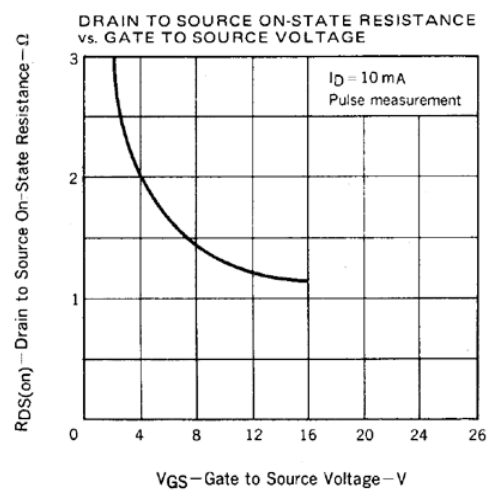
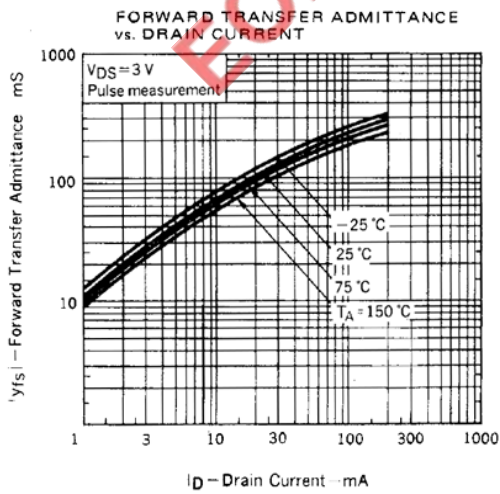
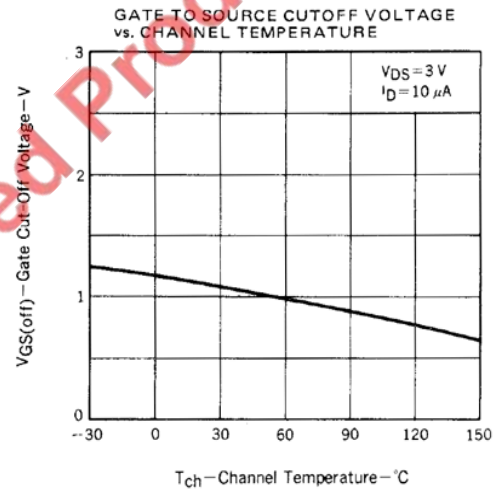
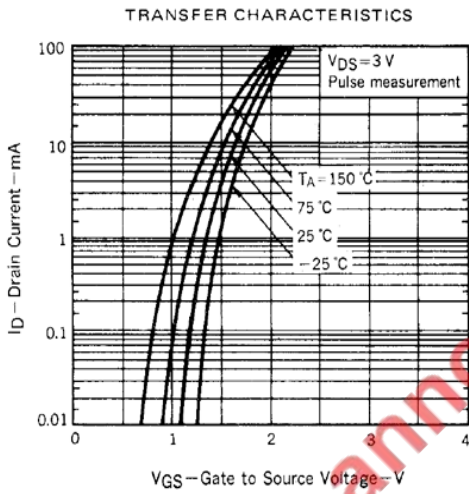
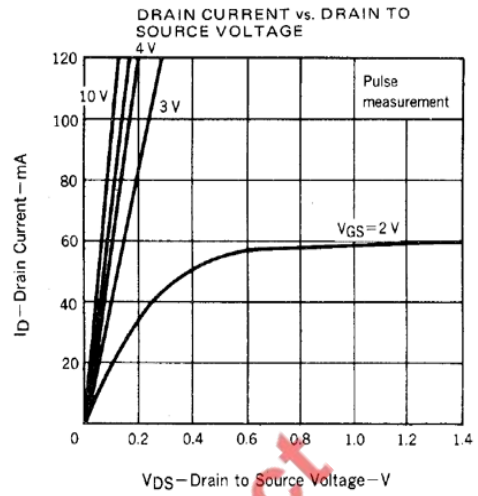
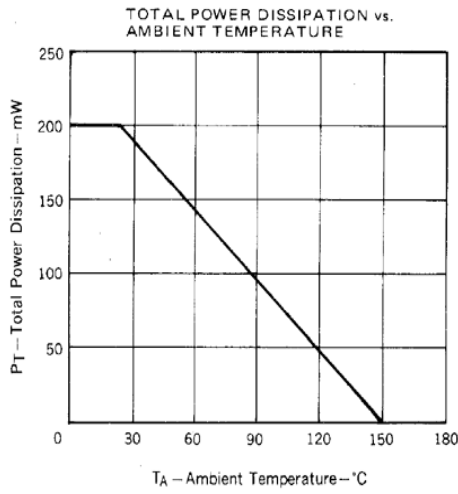
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±3.0 V, V <sub>DS</sub> = 0 V			±5.0	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 10 μA	0.8	1.1	1.6	V
Forward Transfer Admittance <b>Note</b>	y <sub>fs</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 10 mA	20	70		mS
Drain to Source On-state Resistance <b>Note</b>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1.0 mA		3.2	5.0	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 1.0 mA		2.2	3.0	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3.0 V		27		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		37		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		8.0		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3.0 V, I <sub>D</sub> = 10 mA		100		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = 3.0 V		300		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		210		ns
Fall Time	t <sub>f</sub>			240		ns

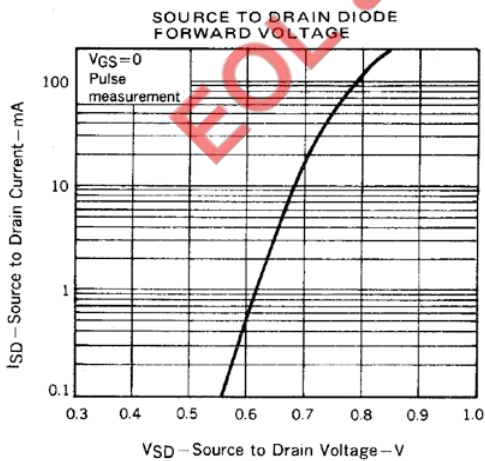
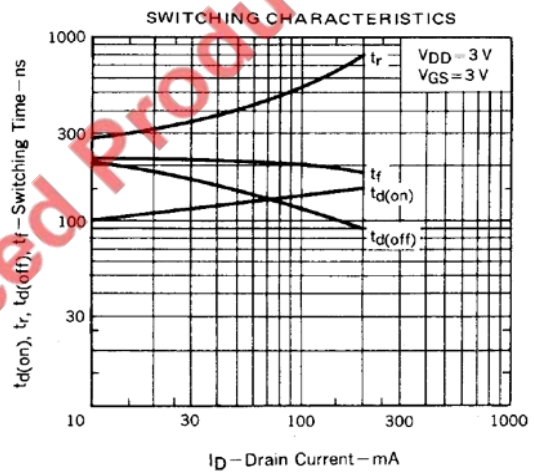
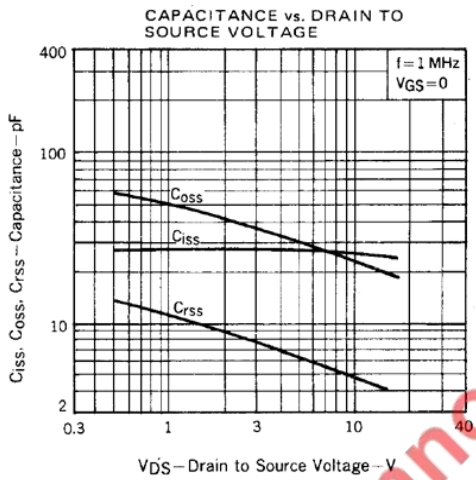
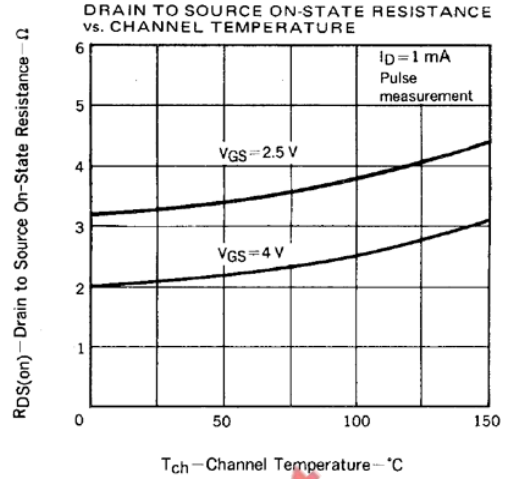
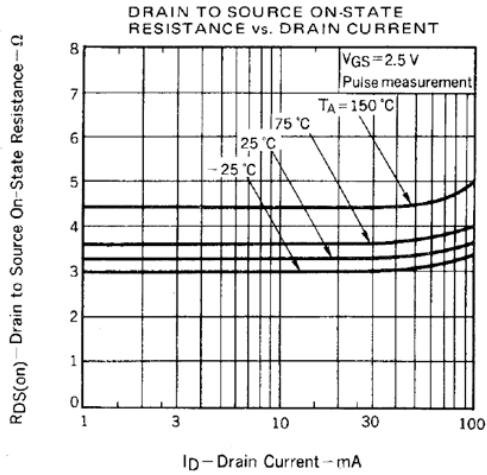
**Note** Pulsed

**TEST CIRCUIT SWITCHING TIME**



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





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