

To our customers,

Old Company Name in Catalogs and Other Documents

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

April 1st, 2010
Renesas Electronics Corporation

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

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EOL announced Product

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MOS FIELD EFFECT TRANSISTOR 2SK1590

N-CHANNEL MOSFET FOR SWITCHING

DESCRIPTION

The 2SK1590, N-channel vertical type MOSFET, is a switching device which can be driven directly by the output of ICs having a 5 V power source.

The MOSFET 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.

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1590	SC-59 (Mini Mold)

Marking: G16

ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

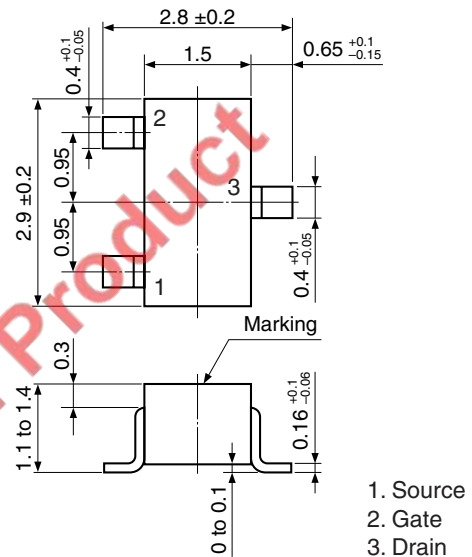
Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	60	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±20	V
Drain Current (DC)	I _{D(DC)}	±200	mA
Drain Current (pulse) <small>Note</small>	I _{D(pulse)}	±400	mA
Total Power Dissipation	P _T	200	mW
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Note PW ≤ 10 ms, Duty Cycle ≤ 50%

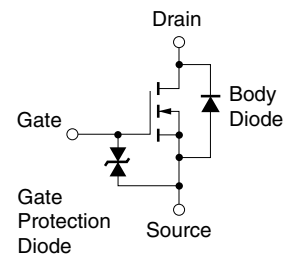
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD.

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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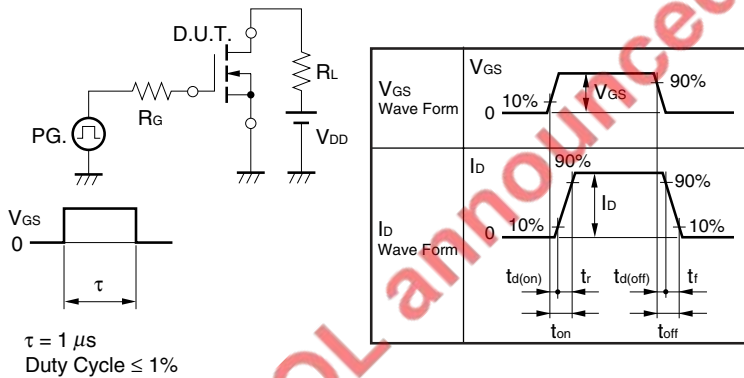
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±1.0	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 5.0 V, I _D = 1.0 μA	0.8	1.2	1.8	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = 5.0 V, I _D = 10 mA	20	65		mS
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = 4.0 V, I _D = 10 mA		3.2	6.0	Ω
	R _{DS(on)2}	V _{GS} = 10 V, I _D = 10 mA		2.4	3.0	Ω
Input Capacitance	C _{iss}	V _{DS} = 5.0 V V _{GS} = 0 V f = 1 MHz		26		pF
Output Capacitance	C _{oss}			20		pF
Reverse Transfer Capacitance	C _{rss}			4.0		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 5.0 V, I _D = 10 mA R _G = 10 Ω		50		ns
Rise Time	t _r			140		ns
Turn-off Delay Time	t _{d(off)}			200		ns
Fall Time	t _f			190		ns

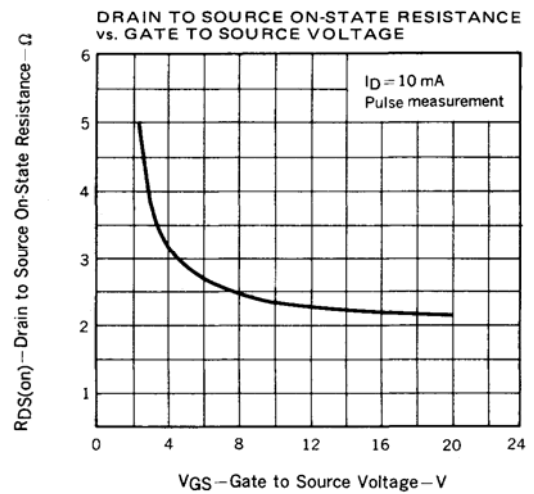
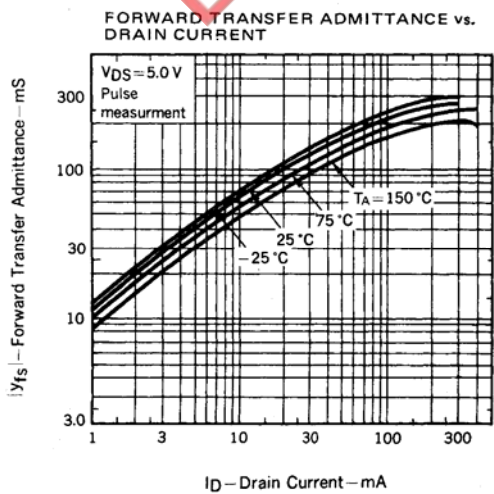
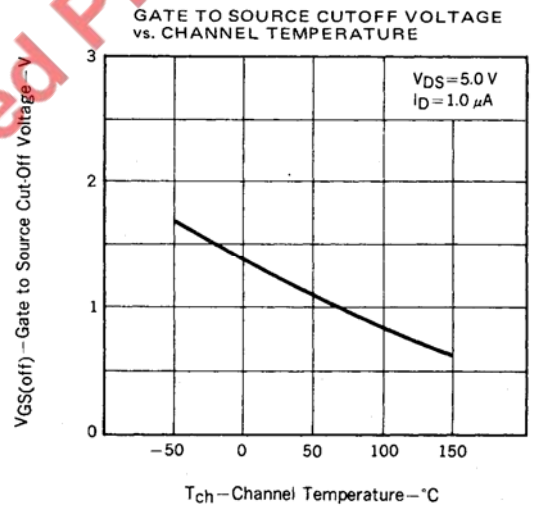
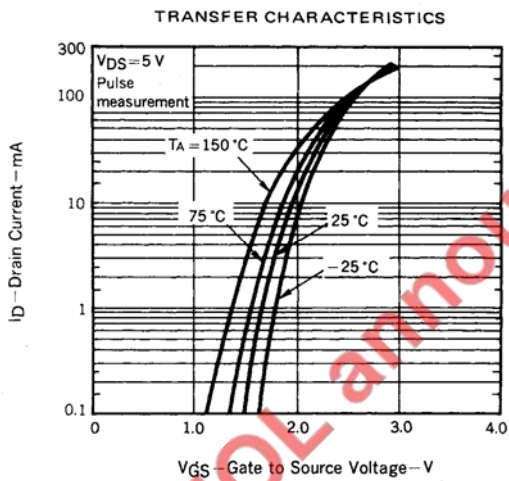
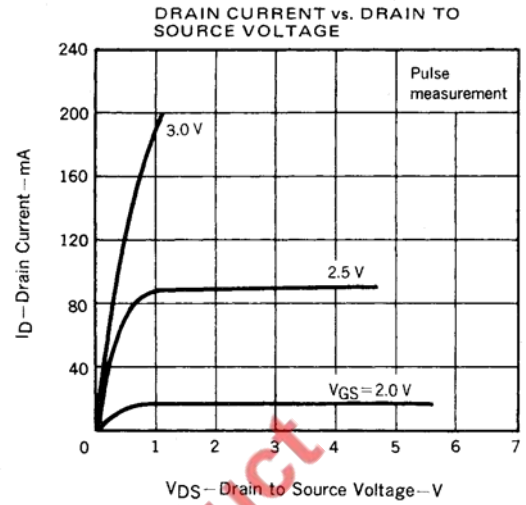
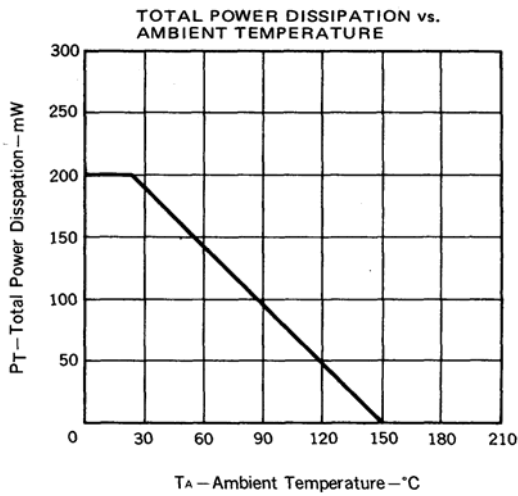
Note Pulsed

TEST CIRCUIT SWITCHING TIME

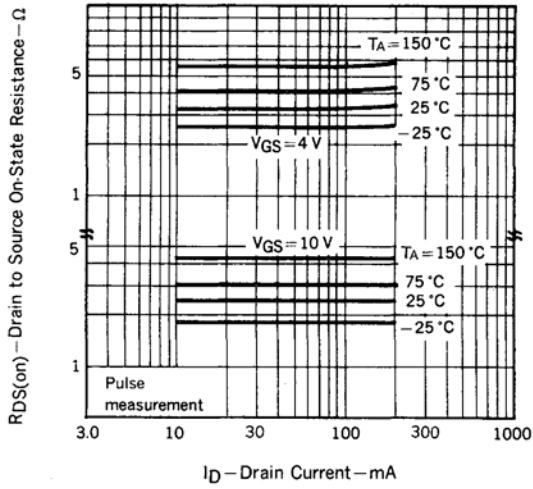


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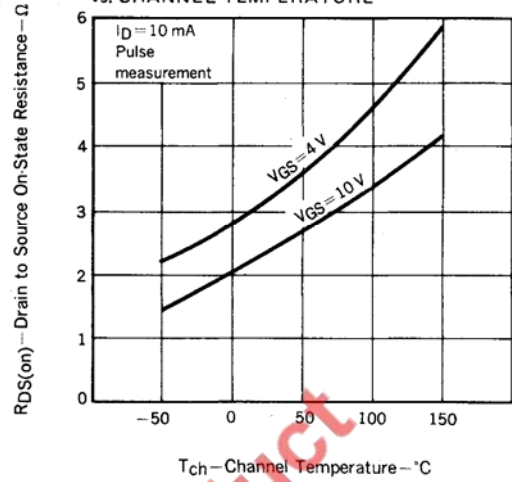
TYPICAL CHARACTERISTICS (T_A = 25°C)



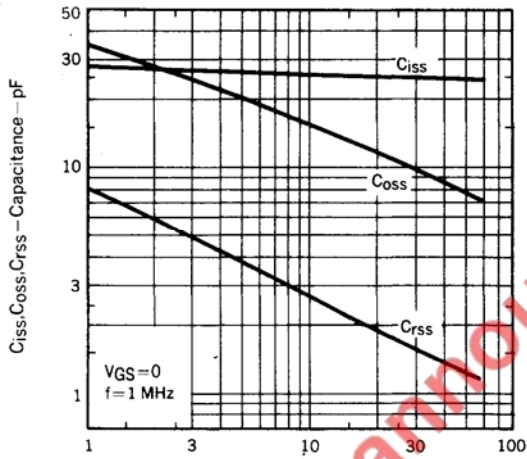
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



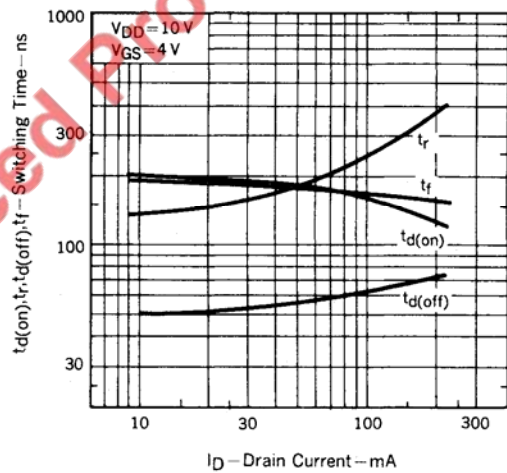
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



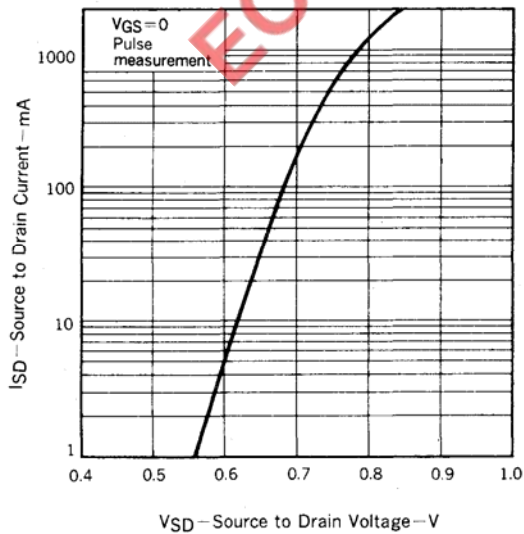
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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