

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

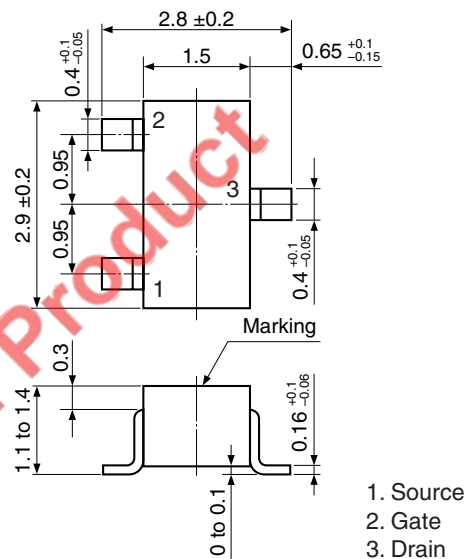
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

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) Note	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

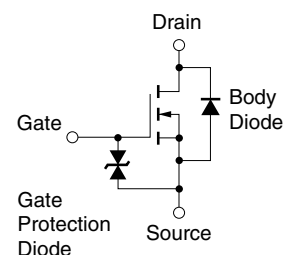
Note PW ≤ 10 ms, Duty Cycle ≤ 50%

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



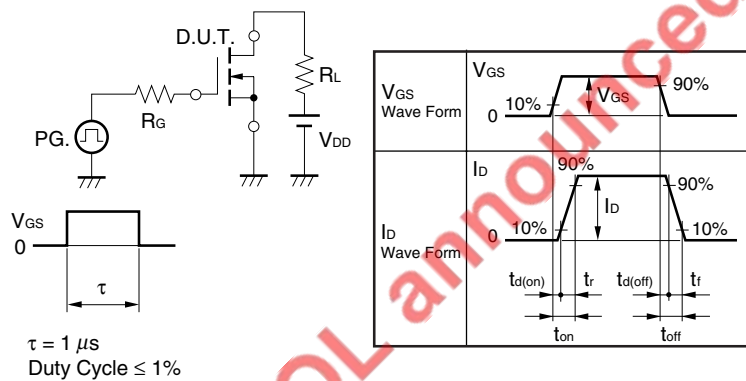
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

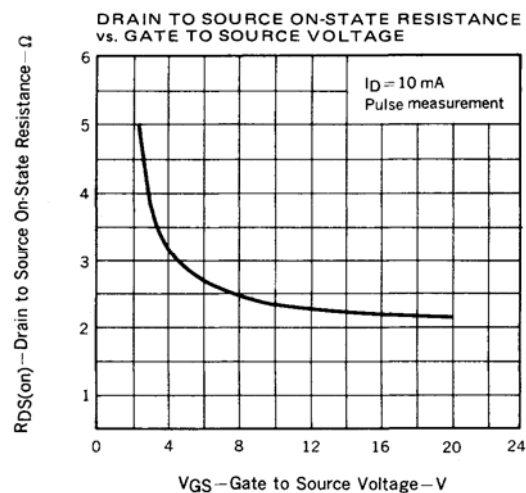
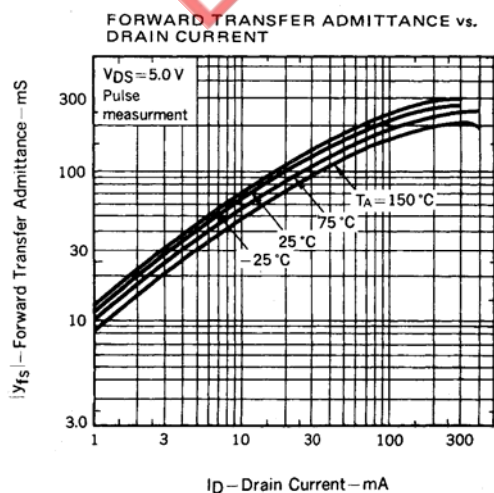
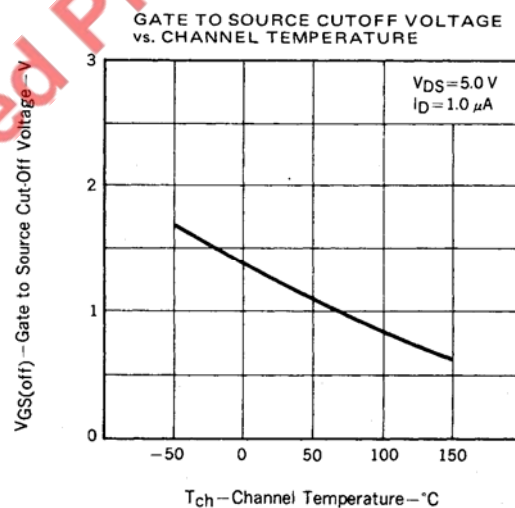
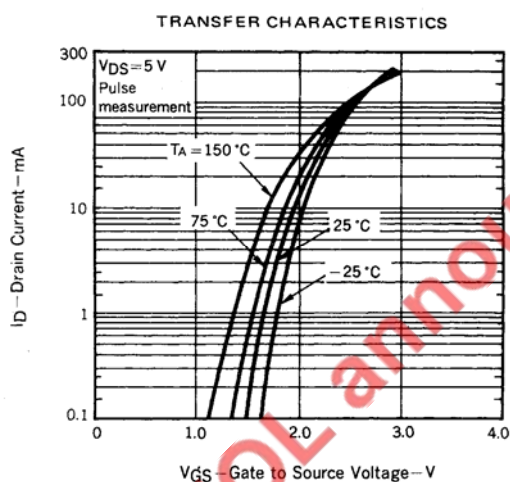
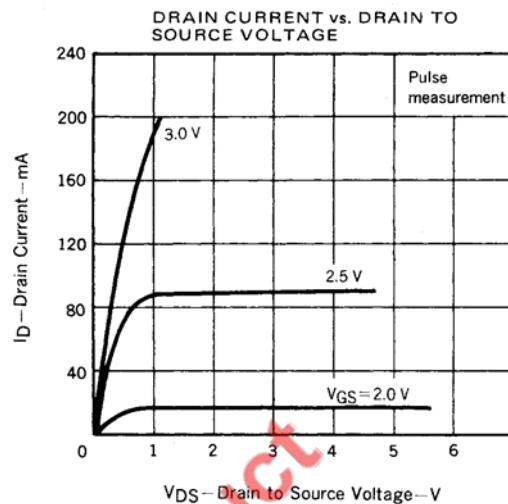
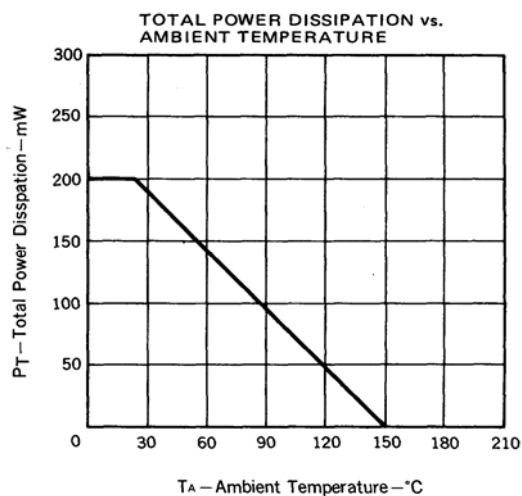
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V			1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±1.0	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 5.0 V, I _D = 1.0 μA	0.8	1.2	1.8	V
Forward Transfer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

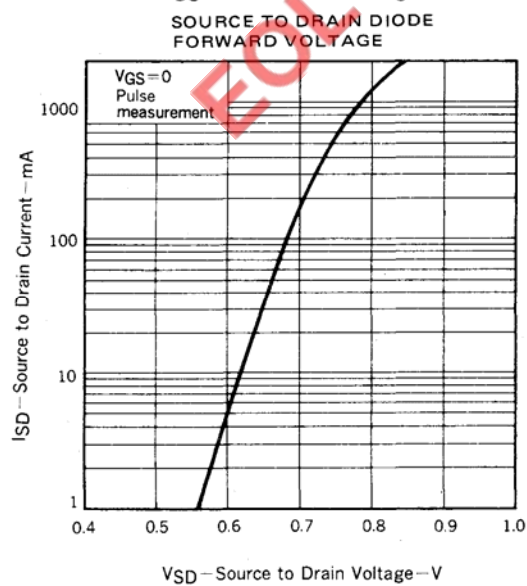
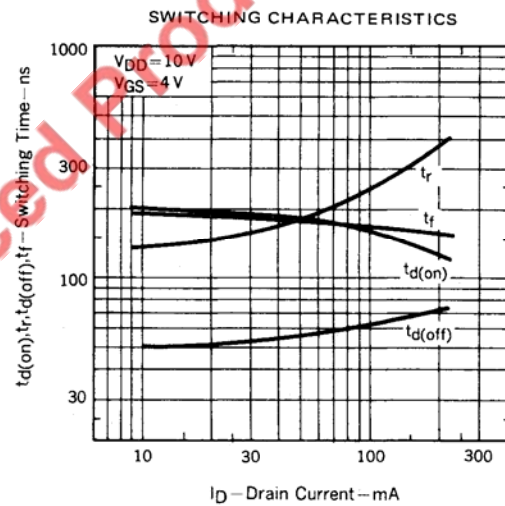
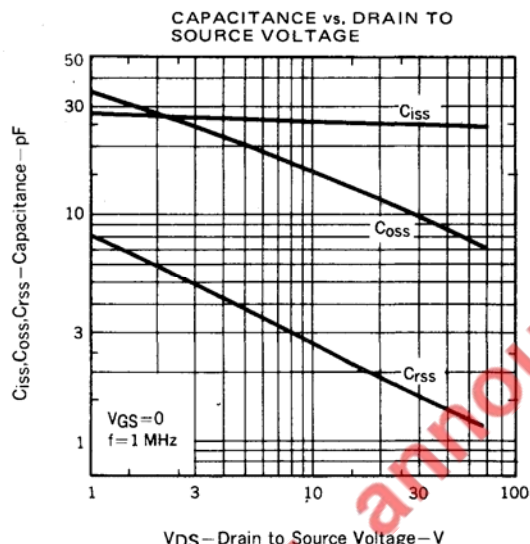
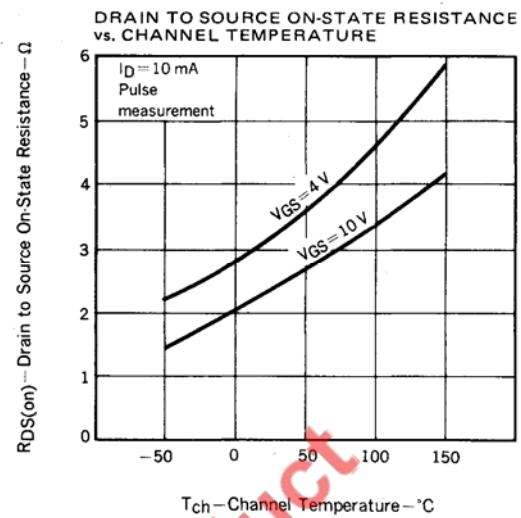
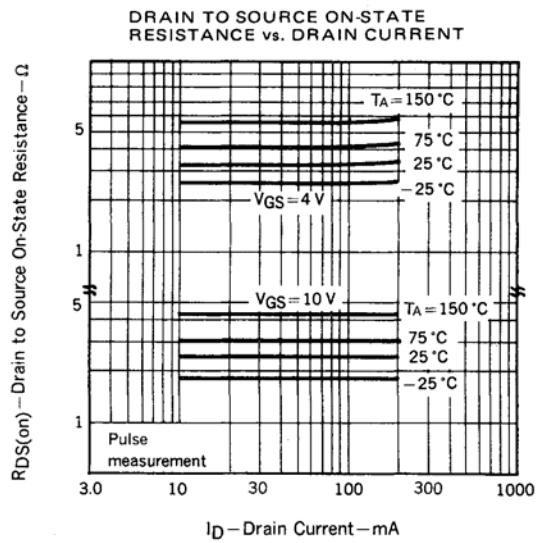
Note Pulsed

TEST CIRCUIT SWITCHING TIME



TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)





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