

To our customers,

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## Old Company Name in Catalogs and Other Documents

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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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N-CHANNEL MOSFET  
FOR SWITCHING

DESCRIPTION

The 2SK1589, 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.

As the MOSFET has low on-state resistance and excellent switching characteristics, it is suitable for driving actuators such as motors, relays, and solenoids.

FEATURES

- Directly by ICs having a 5 V power source.
- Not necessary to consider driving current because of its high input impedance.

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1589	SC-59 (Mini Mold)

Marking: G17

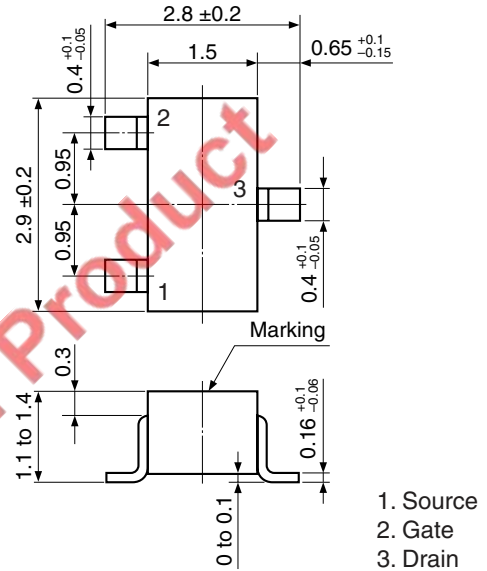
ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Drain to Source Voltage (VGS = 0 V)	VDS	100	V
Gate to Source Voltage (VDS = 0 V)	VGS	±20	V
Drain Current (DC)	ID(DC)	±100	mA
Drain Current (pulse) <sup>Note</sup>	ID(pulse)	±200	mA
Total Power Dissipation	PT	200	mW
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55 to +150	°C

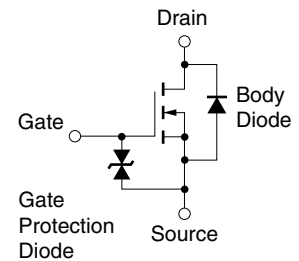
Note PW ≤ 10 ms, Duty Cycle ≤ 50%

**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



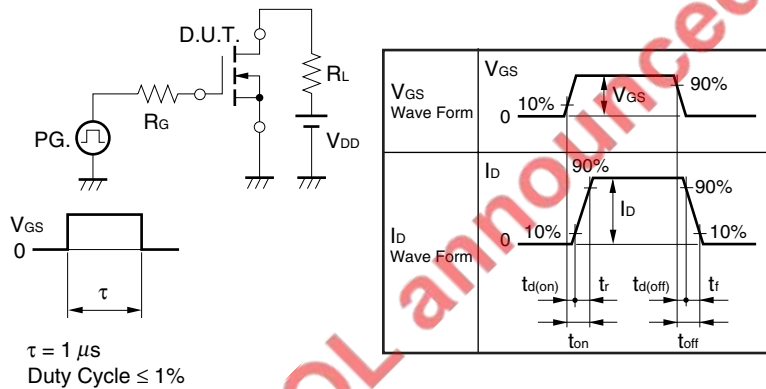
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V			±1.0	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 1.0 μA	0.8	1.5	1.8	V
Forward Transfer Admittance <b>Note</b>	y <sub>fs</sub>	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 10 mA	20	38		mS
Drain to Source On-state Resistance <b>Note</b>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		19	30	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 mA		15	25	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 5.0 V		16		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		12		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		3.0		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 5.0 V, I <sub>D</sub> = 10 mA		17		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = 5.0 V		10		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		68		ns
Fall Time	t <sub>f</sub>			38		ns

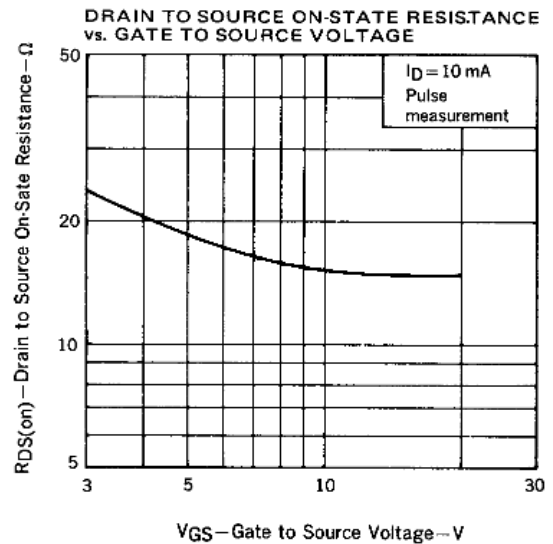
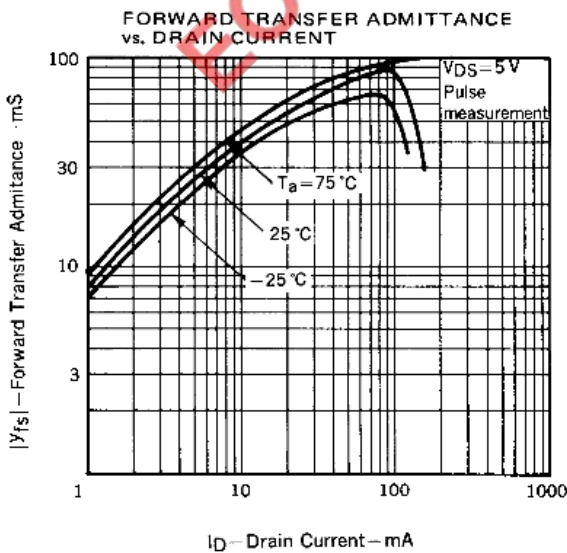
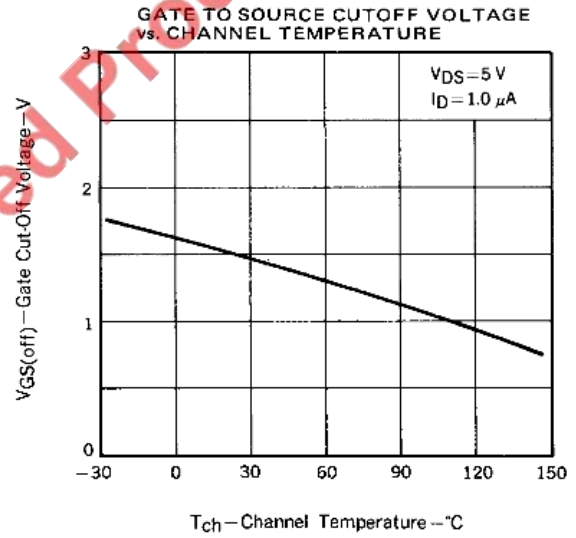
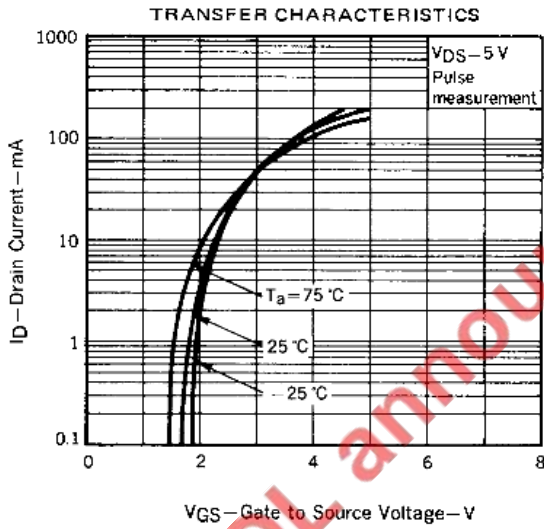
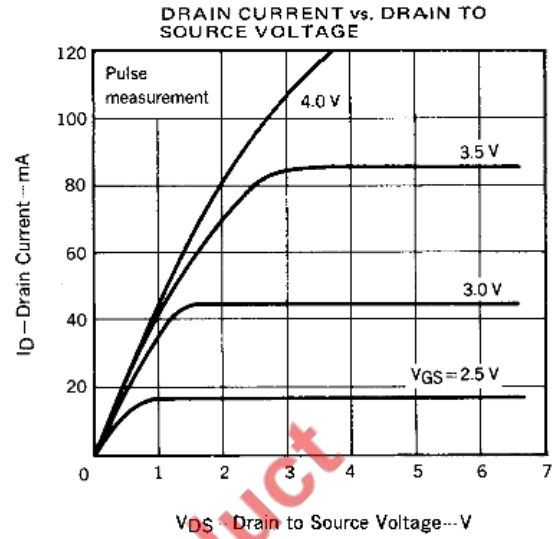
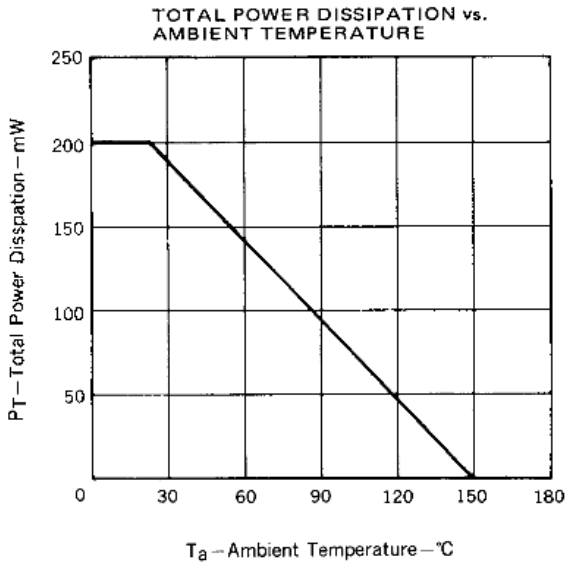
**Note** Pulsed

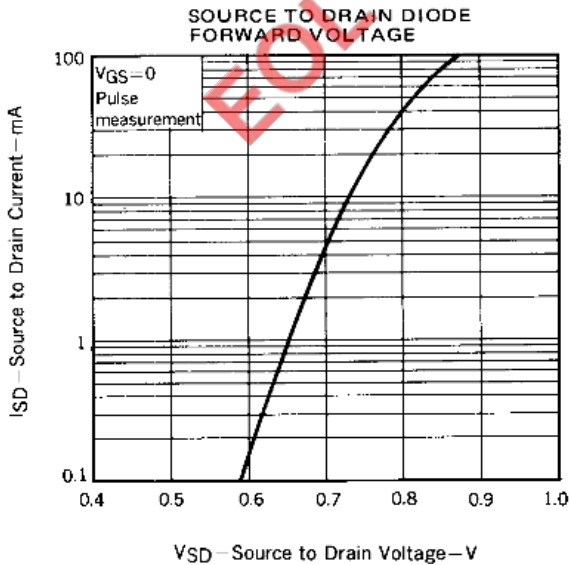
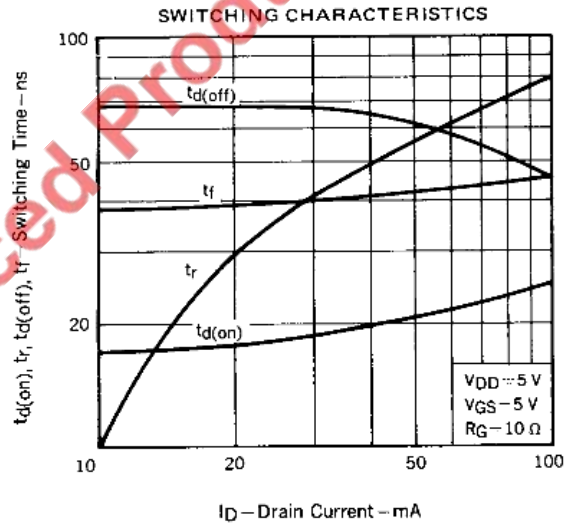
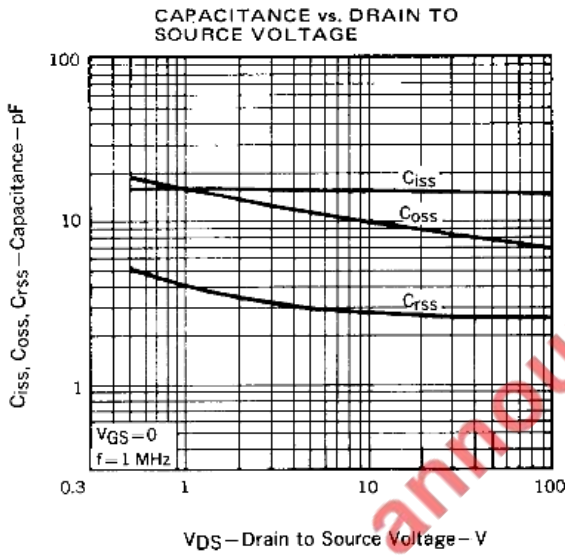
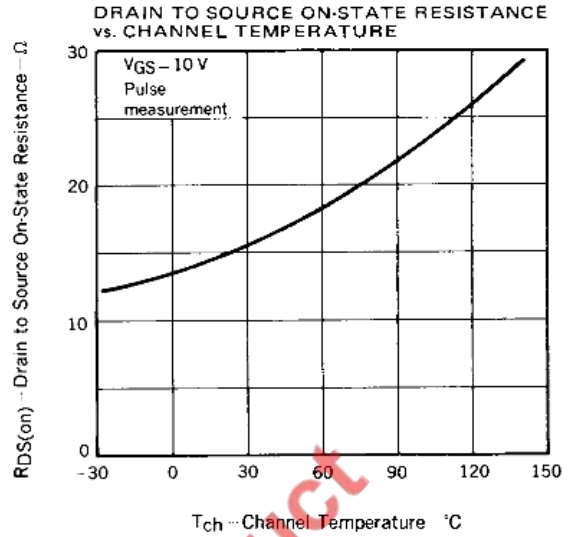
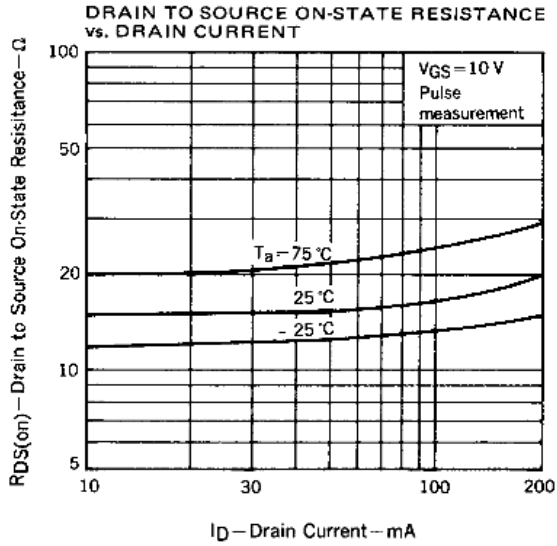
**TEST CIRCUIT SWITCHING TIME**



EOL announced Product

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





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