

To our customers,

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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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N-CHANNEL MOSFET
FOR SWITCHING

DESCRIPTION

The 2SK1657 is an N-channel vertical type MOSFET which can be driven by 2.5 V power supply.

As the MOSFET is low Gate Leakage Current, it is suitable for filter circuit.

FEATURES

- Directly driven by ICs having a 3 V power supply.
- Has low Gate Leakage Current
 $I_{GSS} = \pm 5 \text{ nA MAX. (} V_{GS} = \pm 3.0 \text{ V)}$

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1657	SC-59 (Mini Mold)

Marking: G19

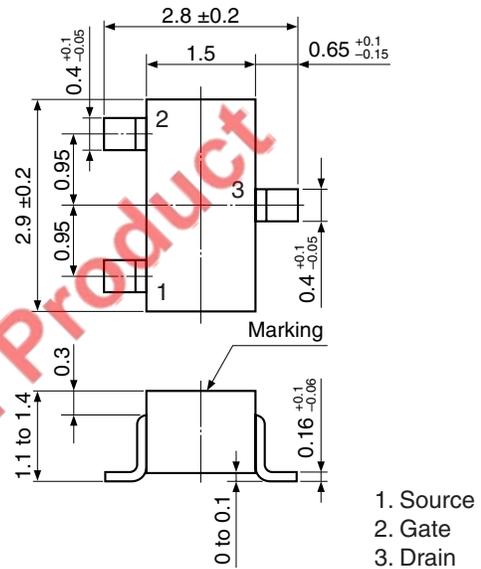
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 7.0	V
Drain Current (DC)	$I_{D(DC)}$	± 100	mA
Drain Current (pulse) ^{Note}	$I_{D(pulse)}$	± 200	mA
Total Power Dissipation	P_T	200	mW
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

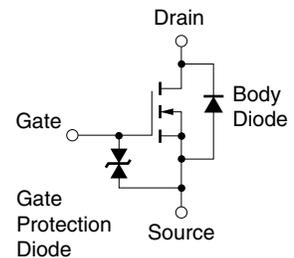
Note $PW \leq 10 \text{ ms, Duty Cycle} \leq 50\%$

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



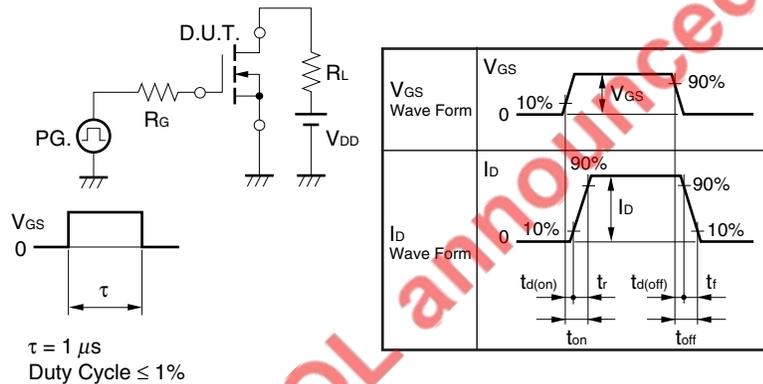
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

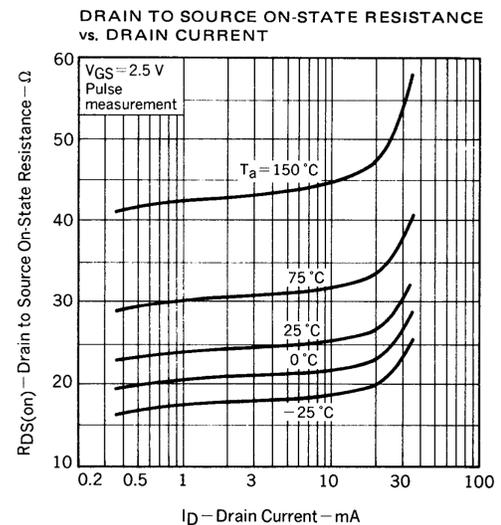
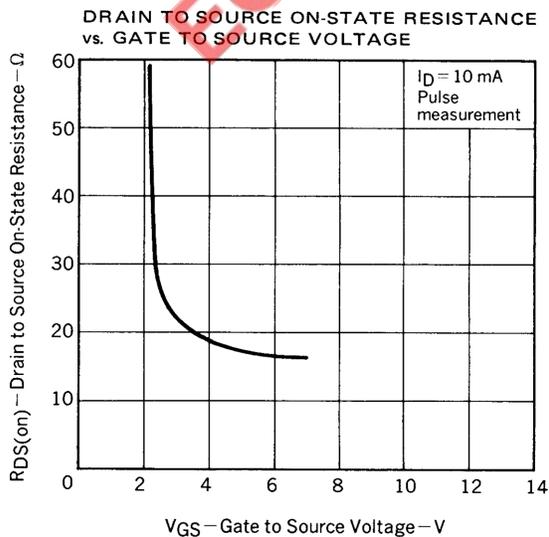
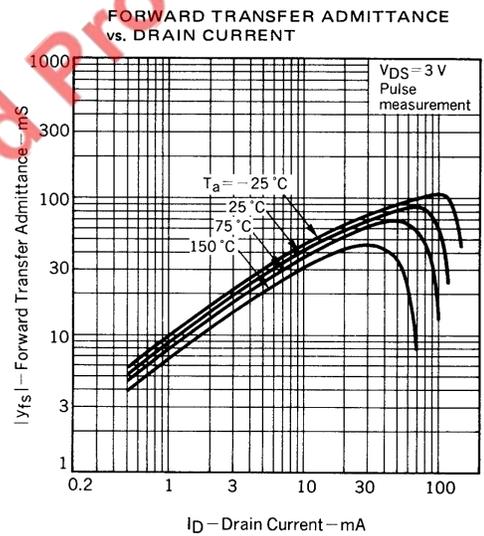
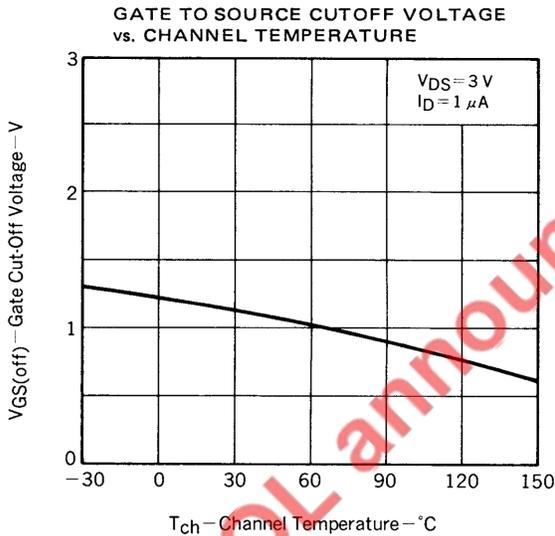
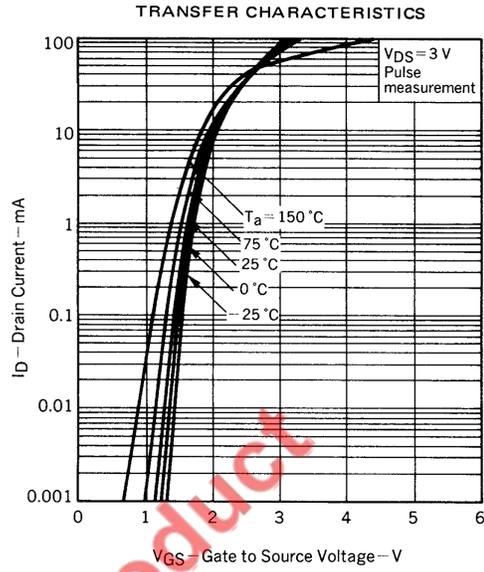
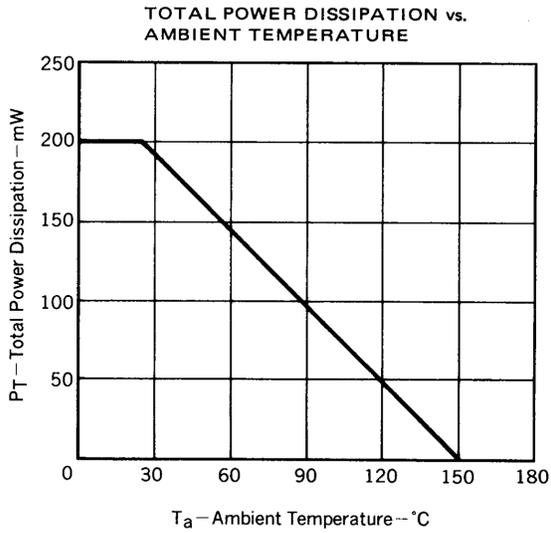
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±3.0 V, V _{DS} = 0 V			±5.0	nA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 3.0 V, I _D = 1.0 μA	0.9	1.2	1.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = 3.0 V, I _D = 10 mA	20	40		mS
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = 2.5 V, I _D = 10 mA		25	45	Ω
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 10 mA		18	25	Ω
Input Capacitance	C _{iss}	V _{DS} = 3.0 V		15		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		10		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		1.5		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 3.0 V, I _D = 10 mA		50		ns
Rise Time	t _r	V _{GS} = 3 V		23		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		34		ns
Fall Time	t _f			43		ns

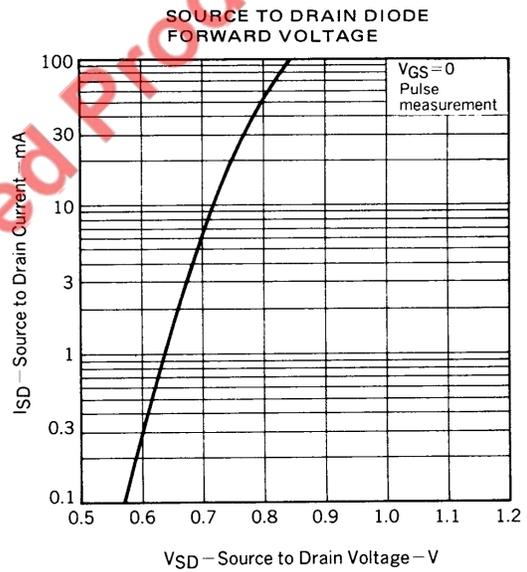
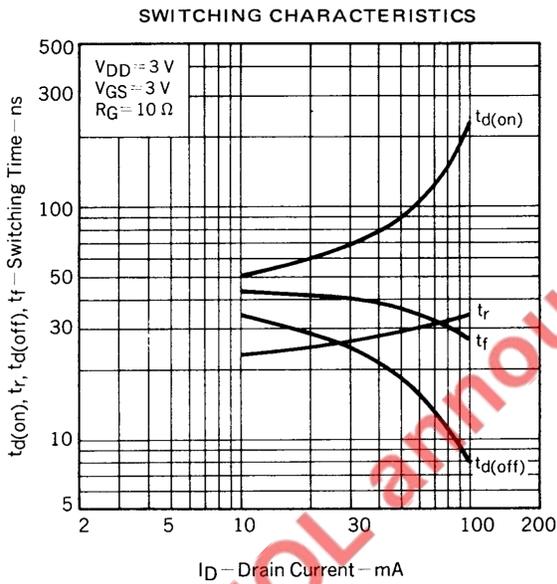
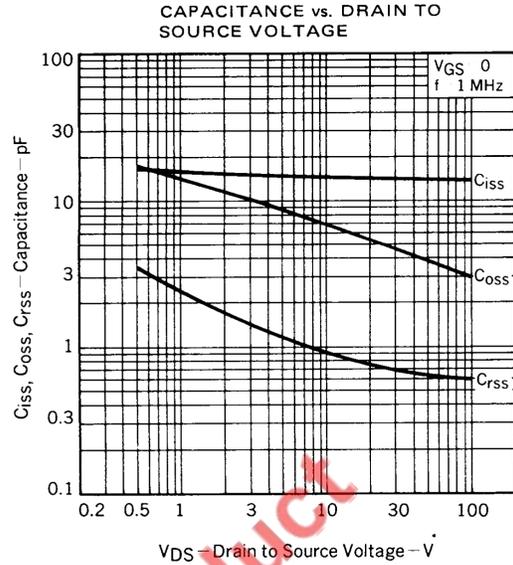
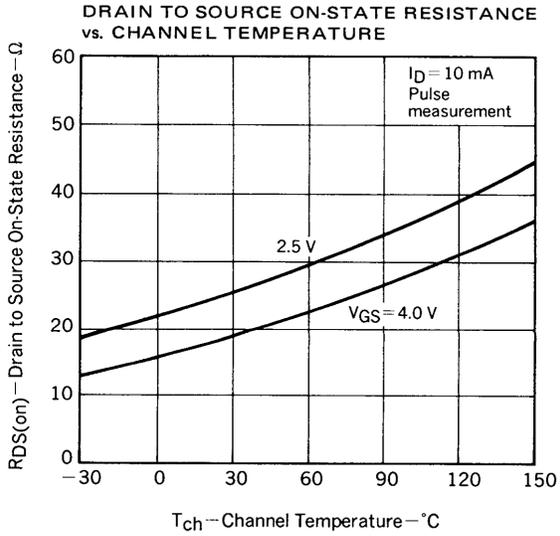
Note Pulsed

TEST CIRCUIT SWITCHING TIME



TYPICAL CHARACTERISTICS (T_A = 25°C)





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