

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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## DATA SHEET



# MOS FIELD EFFECT TRANSISTOR 2SK3663

### N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

#### DESCRIPTION

The 2SK3663 is a switching device which can be driven directly by a 2.5 V power source.

The 2SK3663 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

#### FEATURES

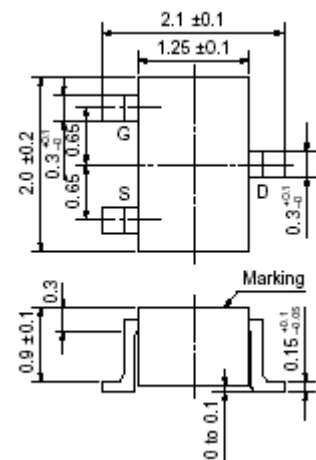
- 2.5 V drive available
  - Low on-state resistance
- $R_{DS(on)1} = 0.57 \Omega$  MAX. ( $V_{GS} = 4.5 V$ ,  $I_D = 0.30 A$ )  
 $R_{DS(on)2} = 0.60 \Omega$  MAX. ( $V_{GS} = 4.0 V$ ,  $I_D = 0.30 A$ )  
 $R_{DS(on)3} = 0.88 \Omega$  MAX. ( $V_{GS} = 2.5 V$ ,  $I_D = 0.15 A$ )

#### ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3663	SC-70 (SSP)

**Remark** Marking : G26

#### PACKAGE DRAWING (Unit: mm)

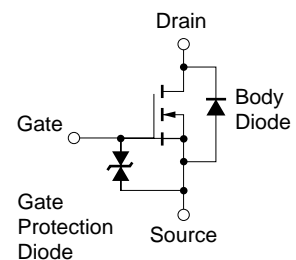


#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ )

Drain to Source Voltage ( $V_{GS} = 0 V$ )	$V_{DSS}$	20	V
Gate to Source Voltage ( $V_{DS} = 0 V$ )	$V_{GSS}$	$\pm 12$	V
Drain Current (DC)	$I_D (DC)$	$\pm 0.5$	A
Drain Current (pulse) <sup>Note1</sup>	$I_D (pulse)$	$\pm 2.0$	A
Total Power Dissipation <sup>Note2</sup>	$P_T$	0.2	W
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

- Notes** 1.  $PW \leq 10 \mu s$ , Duty Cycle  $\leq 1\%$   
 2. Mounted on FR-4 board of  $2500 mm^2 \times 1.1 mm$

#### EQUIVALENT CIRCUIT



**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.

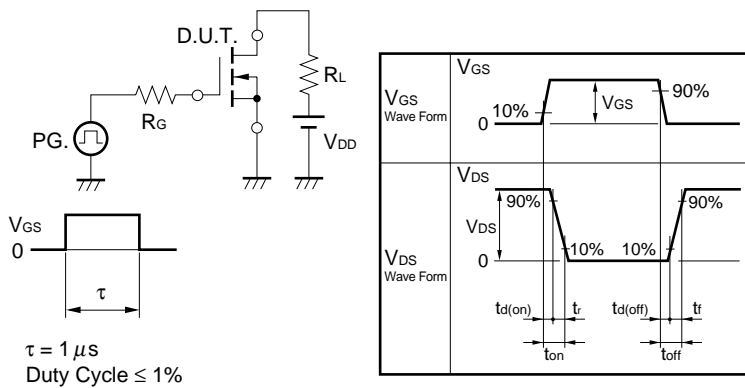
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

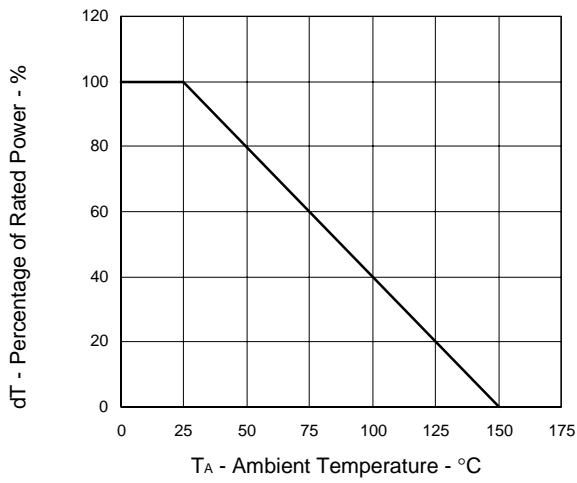
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12 V, V <sub>DS</sub> = 0 V			±10	μA
Gate Cut-off Voltage <sup>Note</sup>	V <sub>GS(off)</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1.0 mA	0.5	1.0	1.5	V
Forward Transfer Admittance <sup>Note</sup>	y <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.30 A	0.25	0.75		S
Drain to Source On-state Resistance <sup>Note</sup>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.30 A		0.38	0.57	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 0.30 A		0.41	0.60	Ω
	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 0.15 A		0.60	0.88	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 10 V		28		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		11		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1.0 MHz		7		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 10 V, I <sub>D</sub> = 0.30 A		20		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = 4.0 V		51		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		94		ns
Fall Time	t <sub>f</sub>			87		ns
Body Diode Forward Voltage	V <sub>F(S-D)</sub>	I <sub>F</sub> = 0.5 A, V <sub>GS</sub> = 0 V		0.87		V

**Note** Pulsed : PW ≤ 350 μs, Duty Cycle ≤ 2%

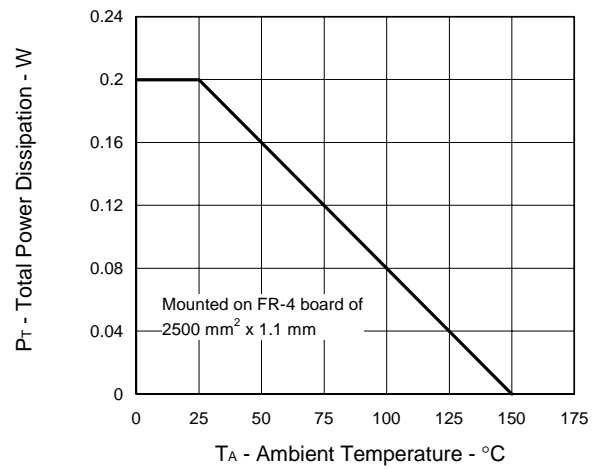
**TEST CIRCUIT SWITCHING TIME**



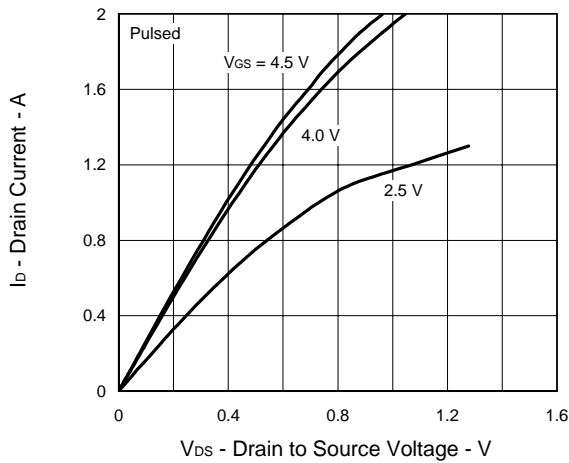
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



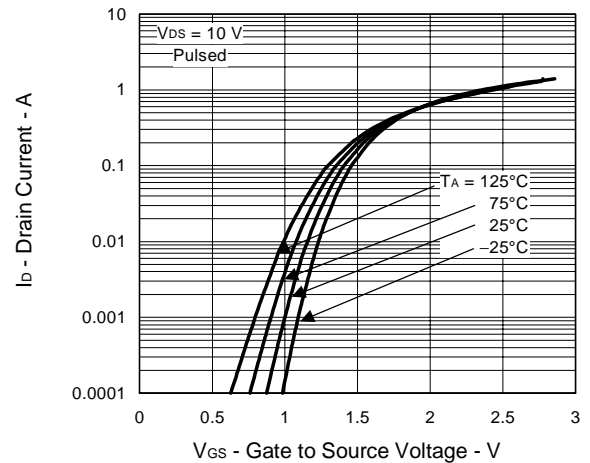
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



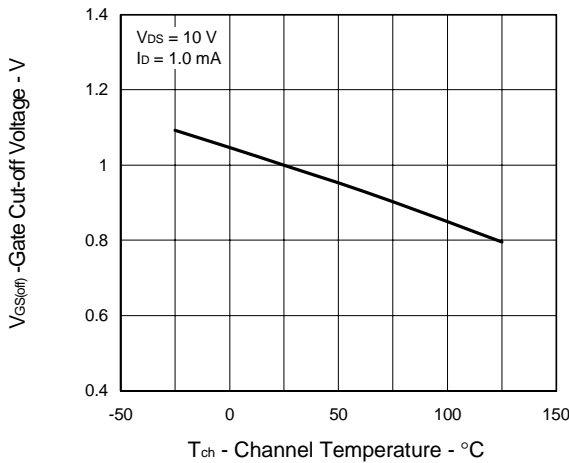
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



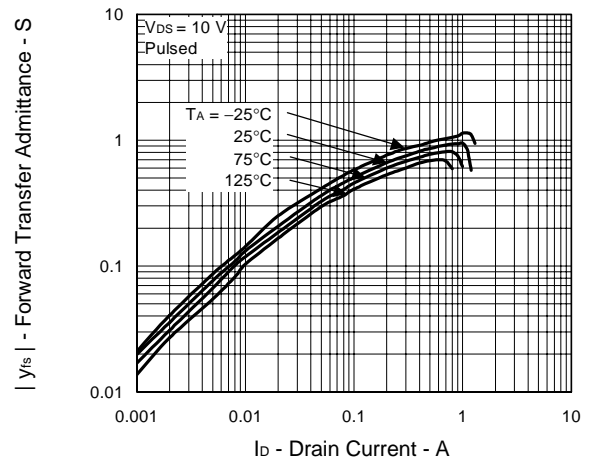
FORWARD TRANSFER CHARACTERISTICS



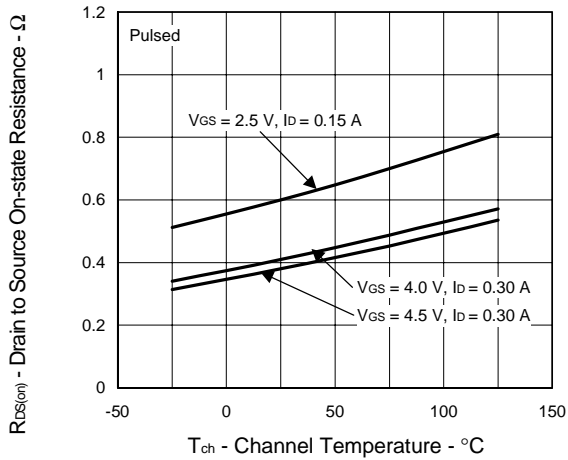
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



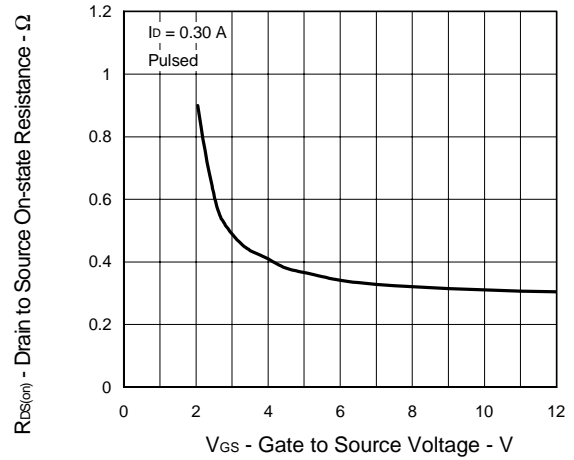
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



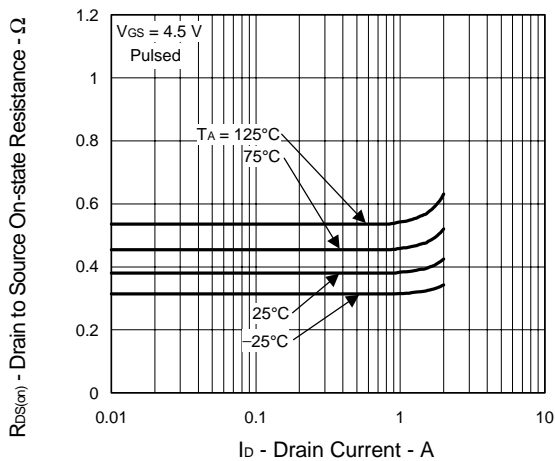
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



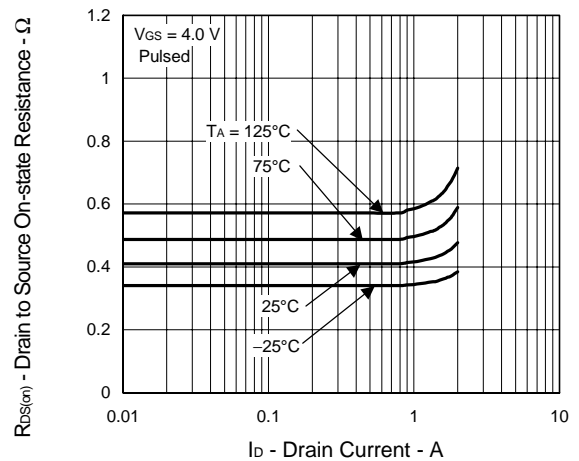
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



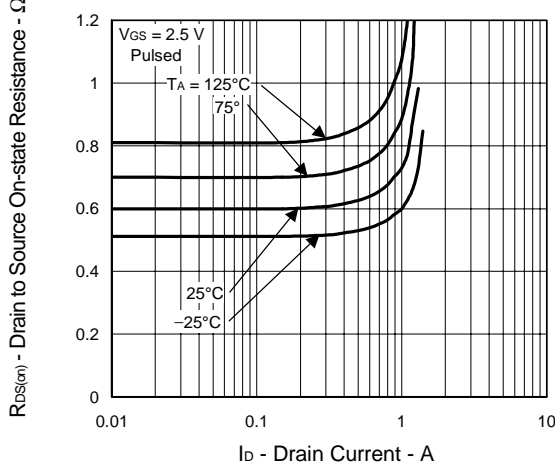
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



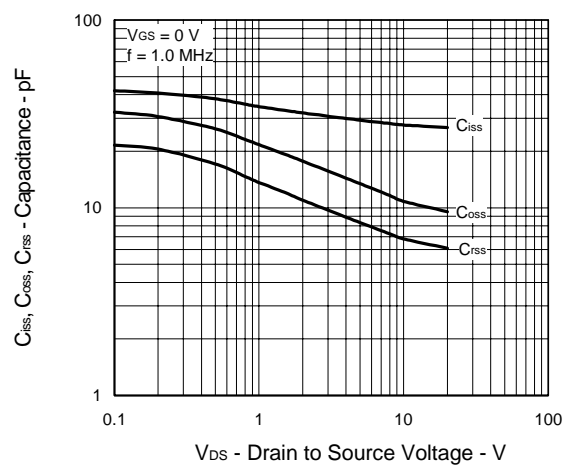
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



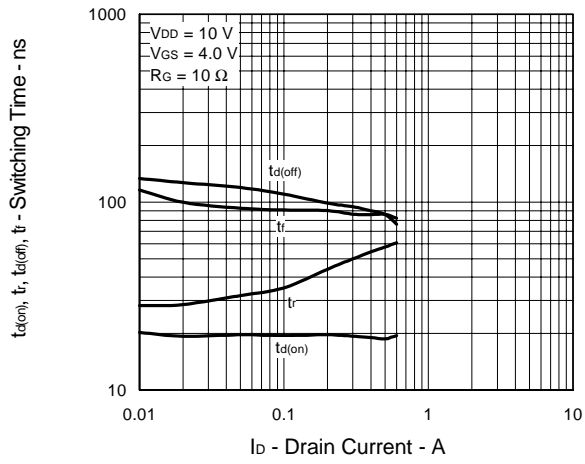
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



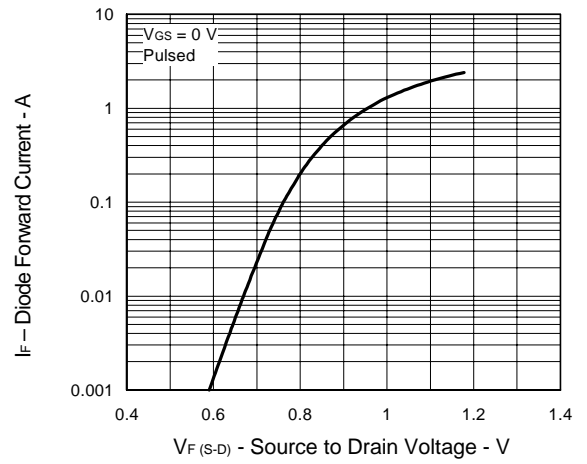
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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