To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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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RENESAS

MOS FIELD EFFECT TRANSISTOR

2SK1958

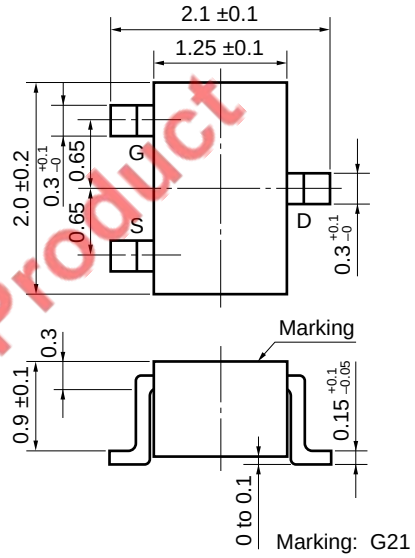
N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

The 2SK1958 is an N-channel vertical MOS FET. Because it can be driven by a voltage as low as 1.5 V and it is not necessary to consider a drive current, this FET is ideal as an actuator for low-current portable systems such as headphone stereos and video cameras.

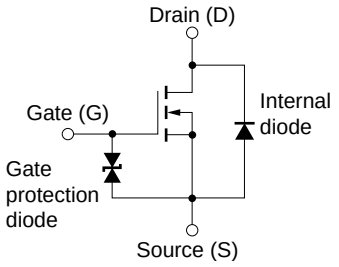
FEATURES

- Gate can be driven by 1.5 V
- Because of its high input impedance, there's no need to consider drive current
- Since bias resistance can be omitted, the number of components required can be reduced

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CURCUIT



PIN CONNECTIONS

S: Source
D: Drain
G: Gate

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ˚C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DSS}	V_{GS} = 0	16	V
Gate to Source Voltage	V_{GSS}	V_{DS} = 0	±7.0	V
Drain Current (DC)	$I_{D(DC)}$		±0.1	A
Drain Current (Pulse)	$I_{D(pulse)}$	PW ≤ 10 ms, duty cycle ≤ 50 %	±0.2	A
Total Power Dissipation	P_T		150	mW
Channel Temperature	T_{ch}		150	˚C
Storage Temperature	T_{stg}		–55 to +150	˚C

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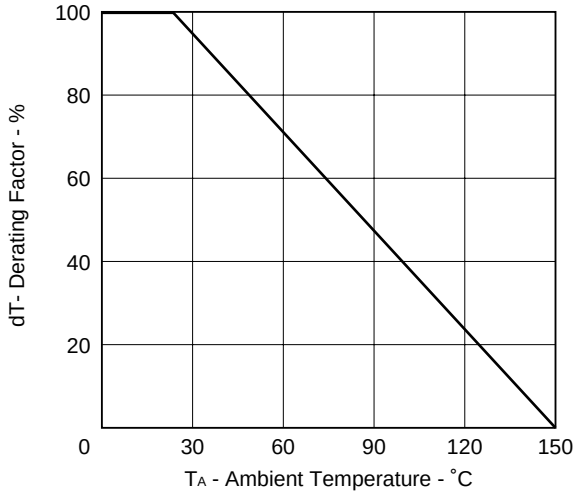
Date Published June 1996 P
Printed in Japan

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

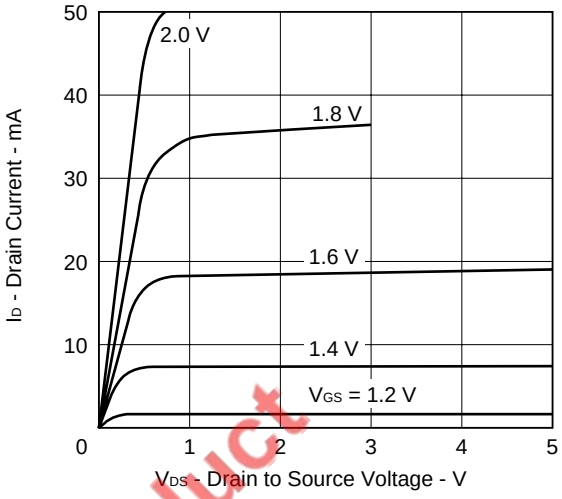
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0			±3.0	μA
Gate Cut-Off Voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_D = 10 μA	0.5	0.8	1.1	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 3 V, I_D = 10 mA	20			mS
Drain to Source On-State Resistance	$R_{DS(on)1}$	V_{GS} = 1.5 V, I_D = 1 mA		20	50	Ω
Drain to Source On-State Resistance	$R_{DS(on)2}$	V_{GS} = 2.5 V, I_D = 10 mA		7	15	Ω
Drain to Source On-State Resistance	$R_{DS(on)3}$	V_{GS} = 4.0 V, I_D = 10 mA		5	12	Ω
Input Capacitance	C_{iss}	V_{DS} = 3 V, V_{GS} = 0, f = 1.0 MHz		10		pF
Output Capacitance	C_{oss}			13		pF
Reverse Transfer Capacitance	C_{rss}			3		pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = 3 V, I_D = 10 mA, $V_{GS(on)}$ = 3 V, R_G = 10 Ω, R_L = 300 Ω		15		ns
Rise Time	t_r			70		ns
Turn-OFF Delay Time	$t_{d(off)}$			100		ns
Fall Time	t_f			110		ns

TYPICAL CHARACTERISTICS (T_A = 25 ˚C)

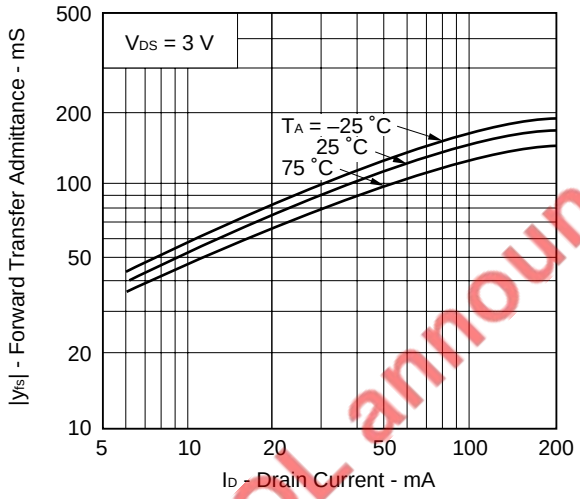
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



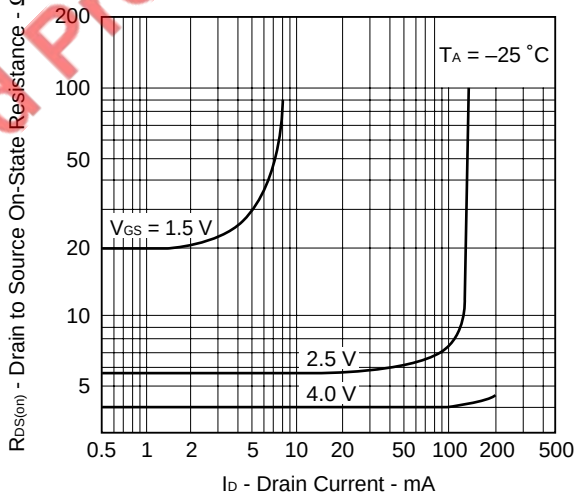
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



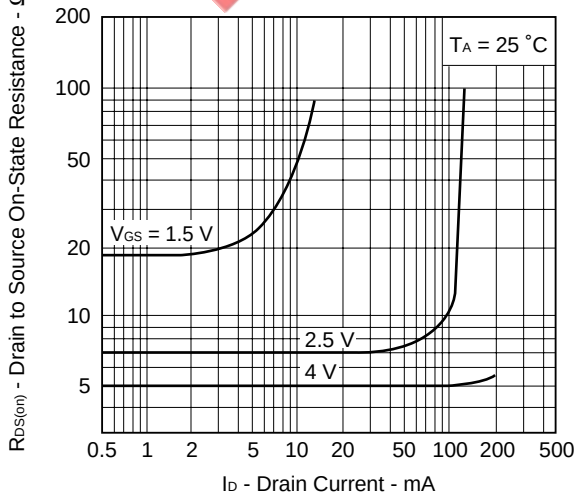
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



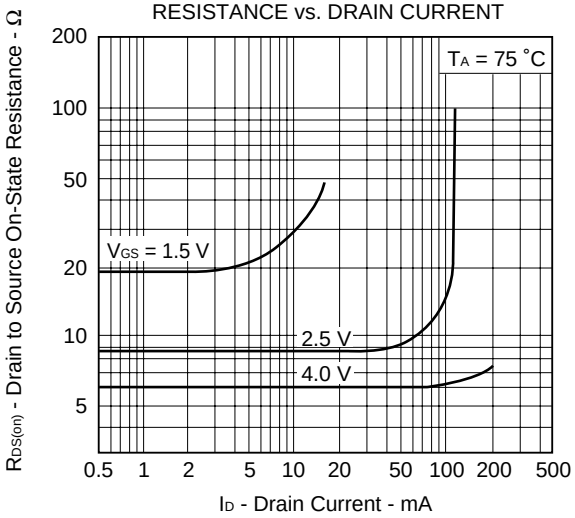
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



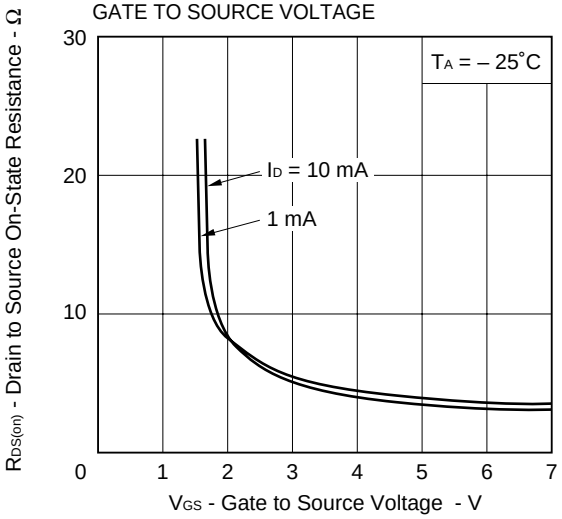
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



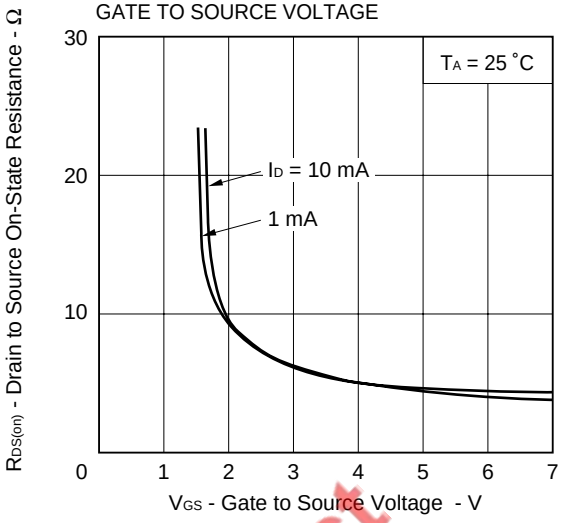
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



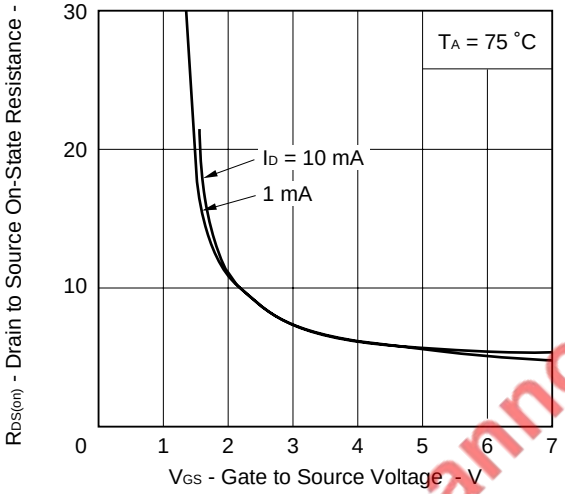
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



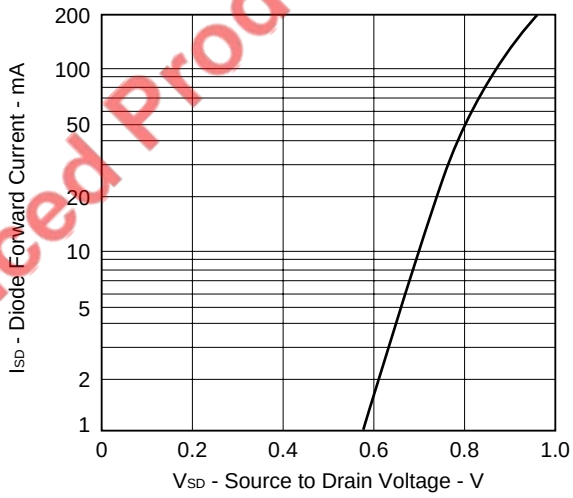
DRAIN TOSOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



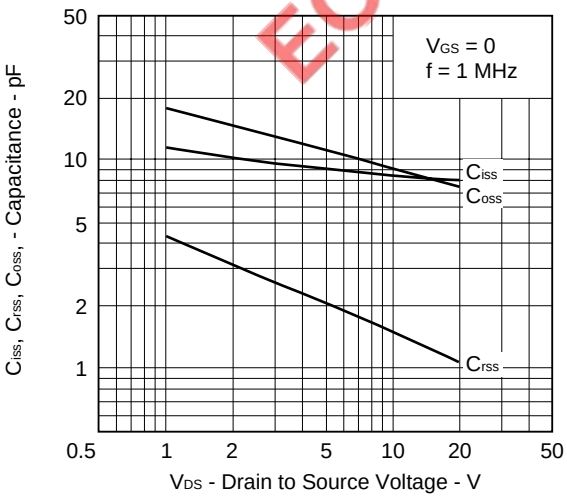
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



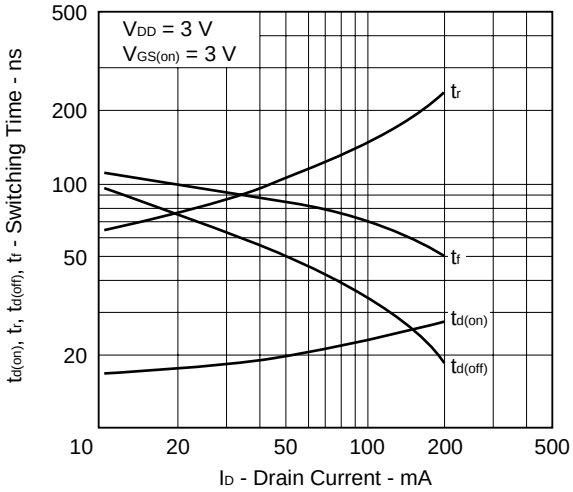
SOURCE TO DRAIN DIODE FORWARD
VOLTAGE



CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

[MEMO]