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

2SK2158

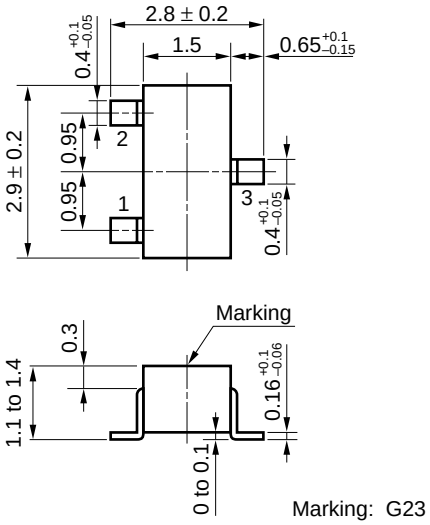
N-CHANNEL MOS FET
FOR HIGH-SPEED SWITCHING

The 2SK2158 is an N-channel vertical type MOS FET featuring an operating voltage as low as 1.5 V. Because it can be driven on a low voltage and it is not necessary to consider driving current, the 2SK2158 is suitable for use in low-voltage portable systems such as headphone stereo sets and camcorders.

FEATURES

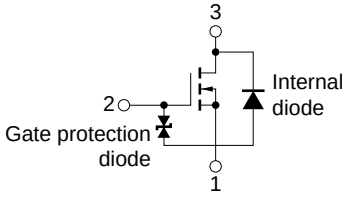
- Capable of drive gate with 1.5 V
- Because of high input impedance, there is no need to consider driving current.
- Bias resistance can be omitted, enabling reduction in total number of parts.

PACKAGE DIMENSIONS
(in millimeters)



Marking: G23

EQUIVALENT CIRCUIT



PIN CONNECTION
1. Source (S)
2. Gate (G)
3. Drain (D)

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ˚C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Drain to Source Voltage	V_{DSS}	V_{GS} = 0	50	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		200	mW
Channel Temperature	T_{ch}		150	˚C
Storage Temperature	T_{stg}		–55 to +150	˚C

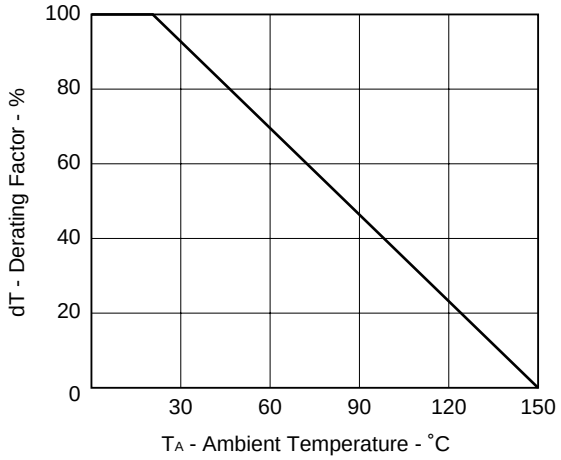
Document No. D11234EJ1V0DS00 (1st edition)
Date Published June 1996 P
Printed in Japan

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

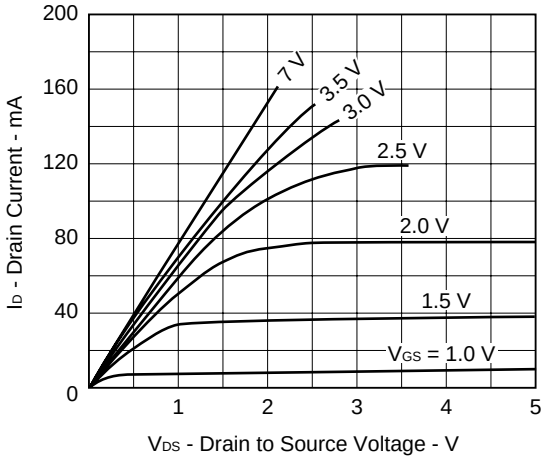
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I_{DSS}	V_{DS} = 50 V, V_{GS} = 0			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0			±3.0	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_D = 1.0 μA	0.5	0.7	1.1	V
Forward Transfer Admittance	$\|y_{fs}\|$	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 = 1.0 mA		32	50	Ω
Drain to Source On-state Resistance	$R_{DS(on)2}$	V_{GS} = 2.5 V, I_D = 10 mA		16	20	Ω
Drain to Source On-state Resistance	$R_{DS(on)3}$	V_{GS} = 4.0 V, I_D = 10 mA		12	15	Ω
Input Capacitance	C_{iss}	V_{DS} = 3 V, V_{GS} = 0		6		pF
Output Capacitance	C_{oss}	f = 1.0 MHz		8		pF
Reverse Transfer Capacitance	C_{rss}			1		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 3 V, I_D = 20 mA		9		ns
Rise Time	t_r	$V_{GS(on)}$ = 3 V, R_G = 10 Ω		48		ns
Turn-Off Delay Time	$t_{d(off)}$	R_L = 150 Ω		21		ns
Fall Time	t_f			31		ns

TYPICAL CHARACTERISTICS (T_A = 25 ˚C)

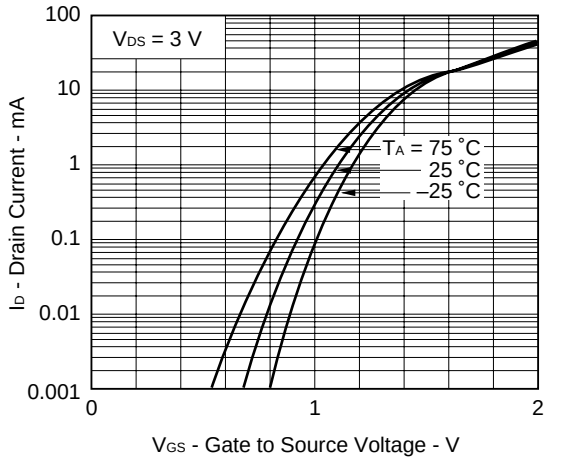
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



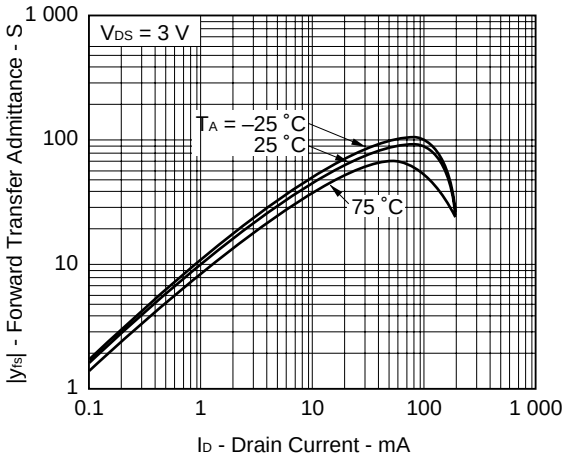
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



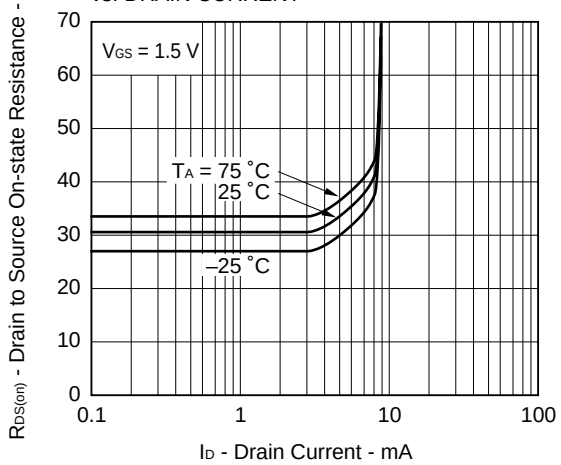
TRANSFER CHARACTERISITICS



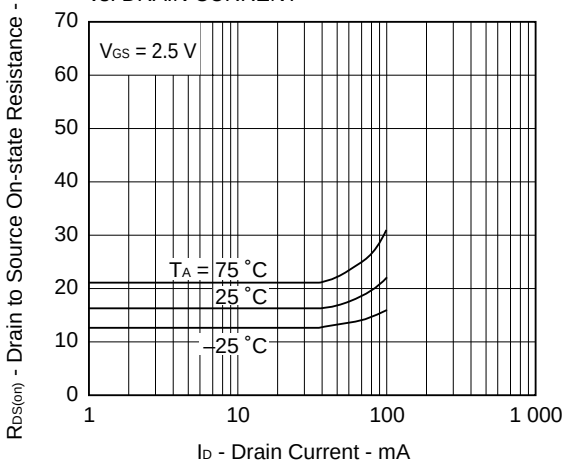
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



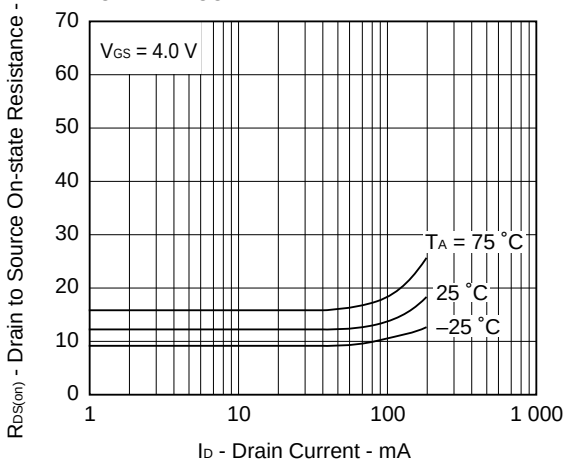
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



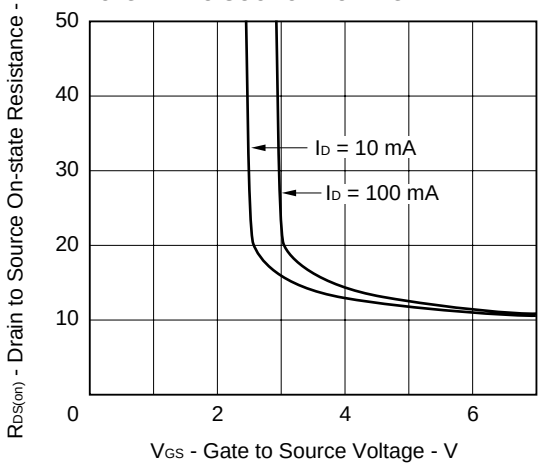
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



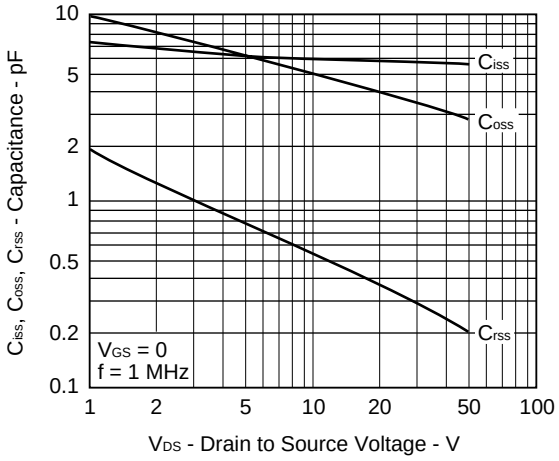
DRAIN TO SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT



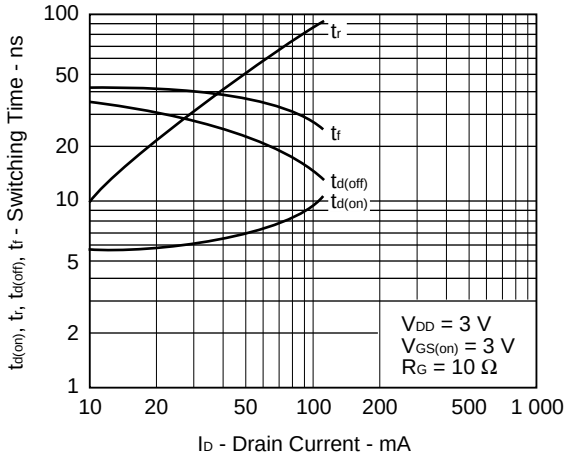
DRAIN TO SOURCE ON-STATE RESISTANCE
vs. GATE TO SOURCE VOLTAGE



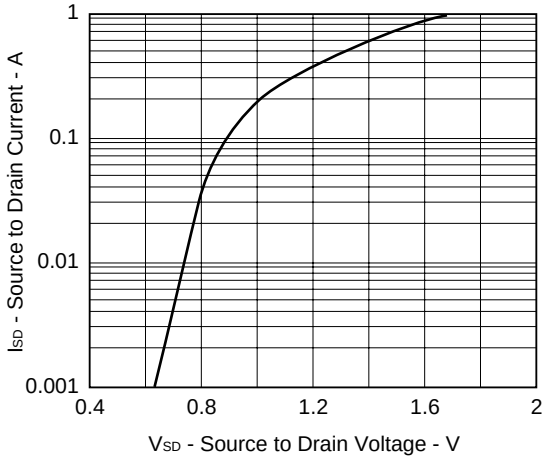
CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE
FORWARD VOLTAGE



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