To our customers,

Old Company Name in Catalogs and Other Documents

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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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RENESAS

MOS FIELD EFFECT TRANSISTOR
2SK2158A

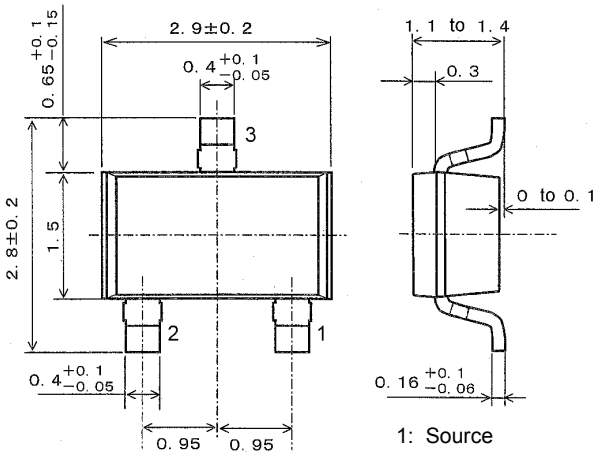
N-CHANNEL MOSFET
FOR HIGH-SPEED SWITCHING

The 2SK2158A is an N-channel vertical type MOSFET 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 2SK2158A 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 DRAWING (Unit: mm)



1: Source
2: Gate
3: Drain

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK2158A-T1B-AT	SC-59 (Mini Mold)
2SK2158A-T2B-AT	

Marking: G23

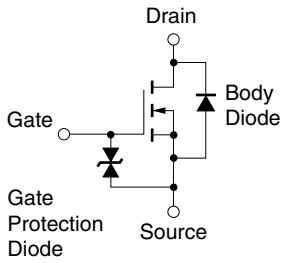
Remark "-AT" indicates Pb-free (This product does not contain Pb in external electrode and other parts.). "-T1B", "-T2B" indicates the unit orientation (8 mm embossed carrier tape, 3,000 pcs/reel).

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	50	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±7.0	V
Drain Current (DC)	$I_{D(DC)}$	±0.1	A
Drain Current (pulse) **Note**	$I_{D(pulse)}$	±0.2	A
Total Power Dissipation	P_T	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Note PW ≤ 10 ms, Duty Cycle ≤ 50%

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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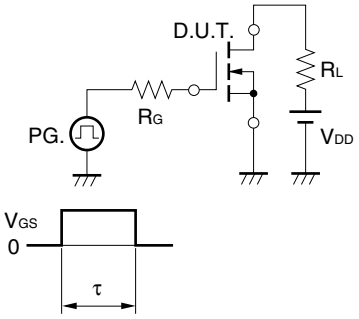
Date Published February 2006 NS CP(K)
Printed in Japan

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

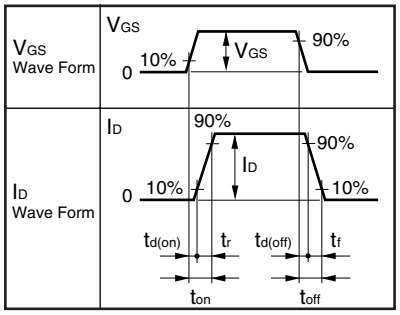
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I_{DSS}	V_{DS} = 50 V, V_{GS} = 0 V			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0 V			±3.0	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 3.0 V, I_D = 1.0 μA	0.5	0.7	1.1	V
Forward Transfer Admittance **Note**	$\|y_{fs}\|$	V_{DS} = 3.0 V, I_D = 10 mA	20			mS
Drain to Source On-state Resistance **Note**	$R_{DS(on)1}$	V_{GS} = 1.5 V, I_D = 1.0 mA		32	50	Ω
	$R_{DS(on)2}$	V_{GS} = 2.5 V, I_D = 10 mA		16	20	Ω
	$R_{DS(on)3}$	V_{GS} = 4.0 V, I_D = 10 mA		12	15	Ω
Input Capacitance	C_{iss}	V_{DS} = 3.0 V		6		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		8		pF
Reverse Transfer Capacitance	C_{rss}	f = 1.0 MHz		1		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 3.0 V, I_D = 20 mA		9		ns
Rise Time	t_r	$V_{GS(on)}$ = 3.0 V		48		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		21		ns
Fall Time	t_f			31		ns

Note Pulsed

TEST CIRCUIT SWITCHING TIME

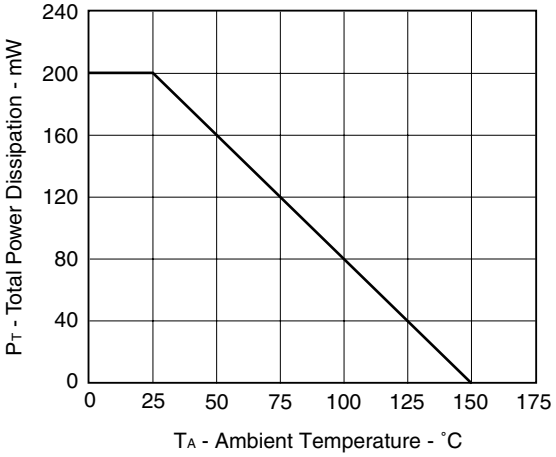


τ = 1 μs
Duty Cycle ≤ 1%

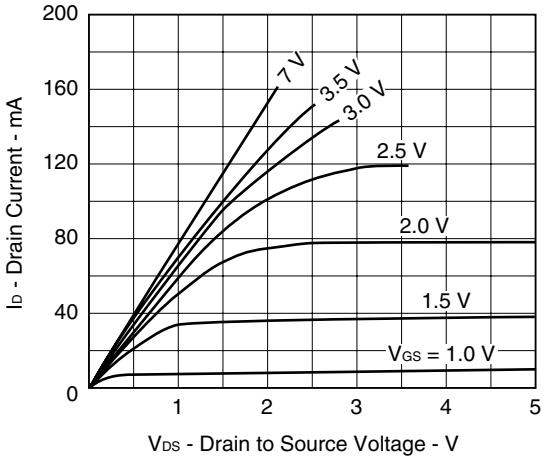


TYPICAL CHARACTERISTICS (T_A = 25°C)

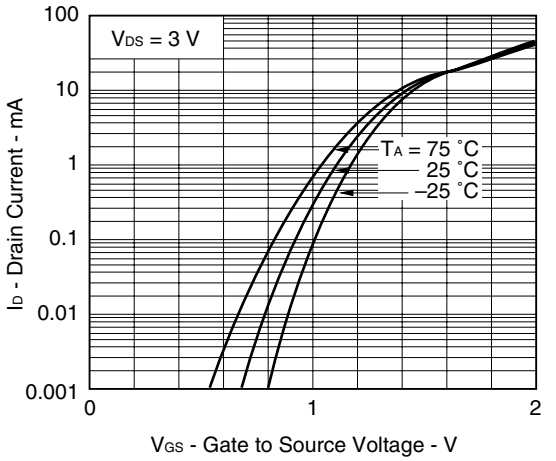
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



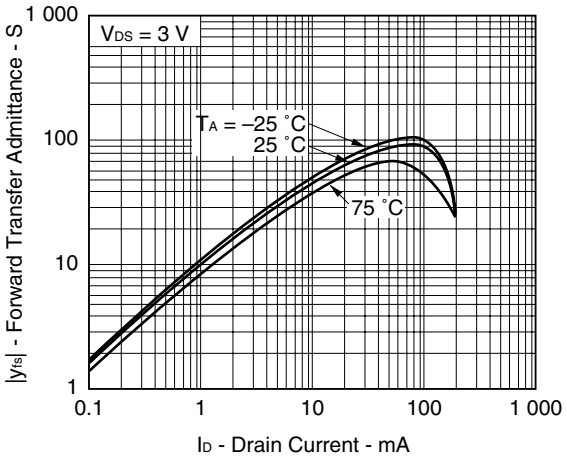
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



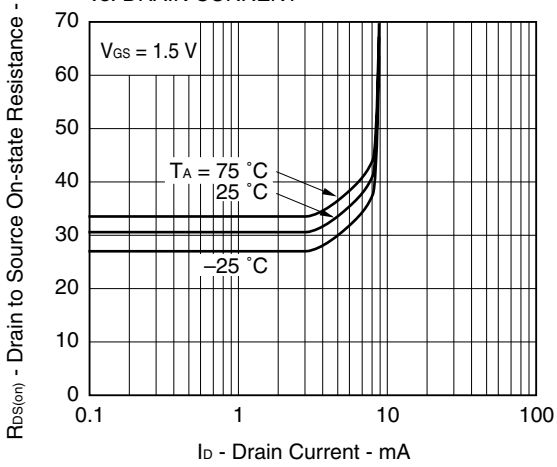
TRANSFER CHARACTERISITICS



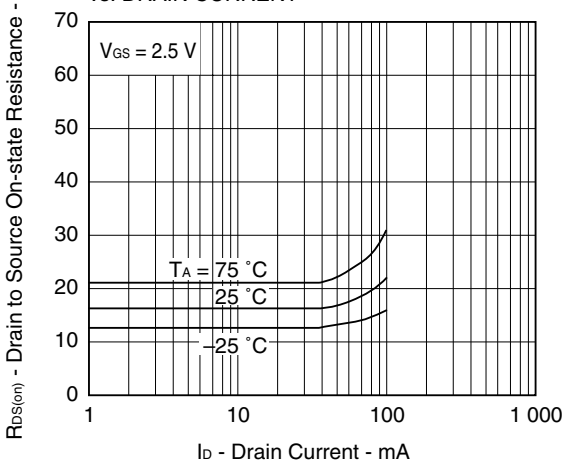
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



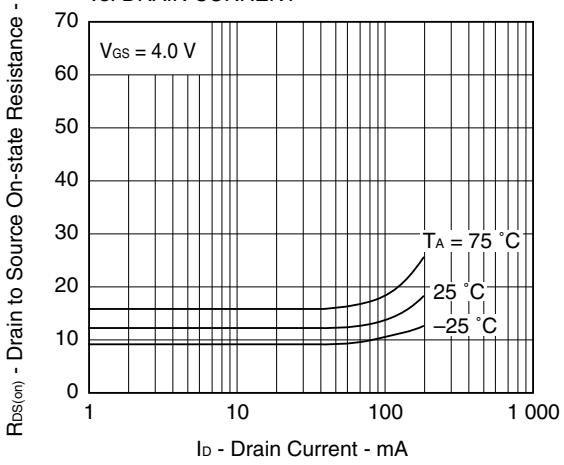
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



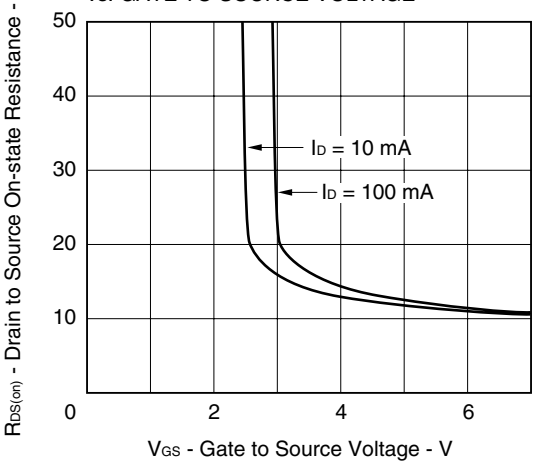
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



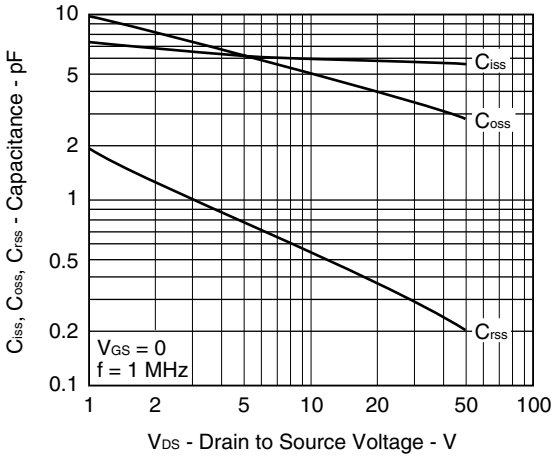
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



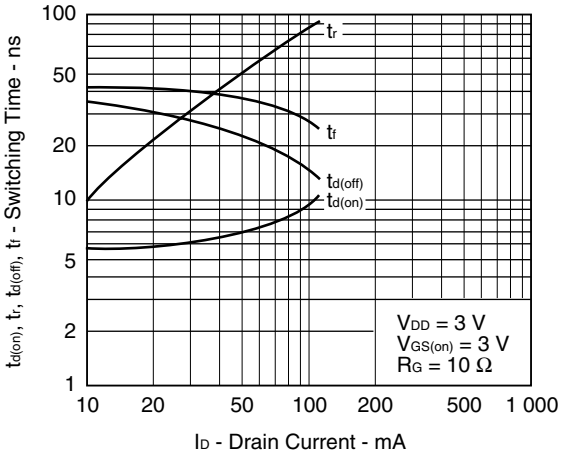
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



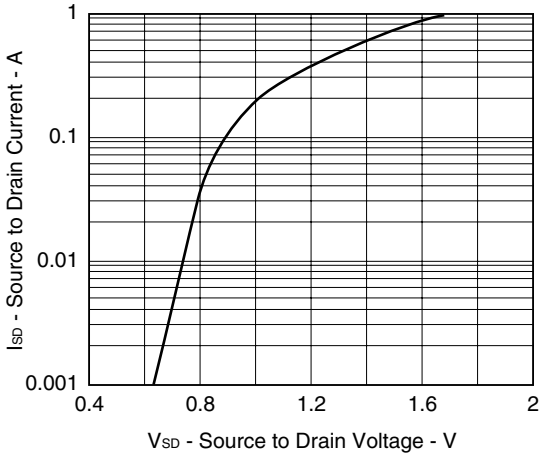
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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