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
2SK1583

SWITCHING
N-CHANNEL MOS FET

DESCRIPTION

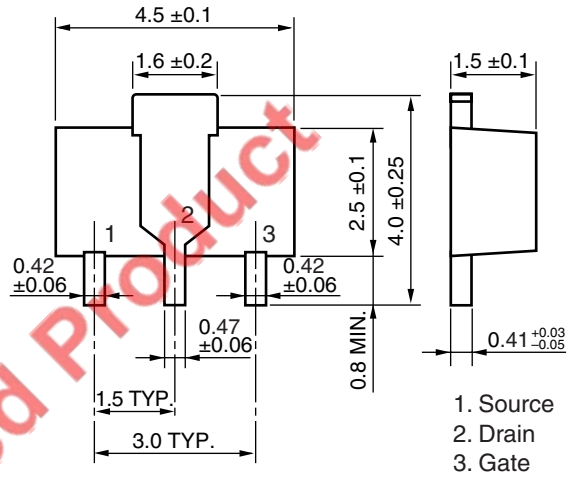
The 2SK1583 is an N-channel vertical type MOS FET can be driven by 2.5 V power supply.

As the 2SK1583 is driven by low voltage and does not require consideration of driving current, it is suitable for appliances including VCR cameras and headphone stereos which need power saving.

FEATURES

- Directly driven by ICs having a 3 V power supply.
- Low on-state resistance
  $R_{DS(on)1}$ = 2.0 Ω MAX. (V_{GS} = 2.5 V, I_D = 0.3 A)
  $R_{DS(on)2}$ = 1.5 Ω MAX. (V_{GS} = 4.0 V, I_D = 0.3 A)

PACKAGE DRAWING (Unit: mm)



★ ORDERING INFORMATION

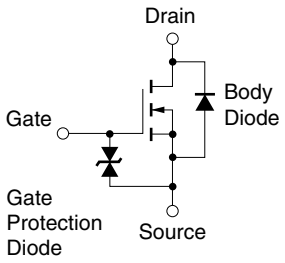
PART NUMBER	PACKAGE
2SK1583	SC-62 (Power Mini Mold)

Marking: ND

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	16	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±16	V
Drain Current (DC)	$I_{D(DC)}$	±0.5	A
Drain Current (pulse) Note1	$I_{D(pulse)}$	±1.0	A
Total Power Dissipation Note2	P_T	2.0	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

EQUIVALENT CIRCUIT



Notes 1. PW ≤ 10 ms, Duty Cycle ≤ 50%

2. Mounted on ceramic substrate of 16 cm^2 x 0.7 mm

★ **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 June 2005 NS CP(K)
Printed in Japan

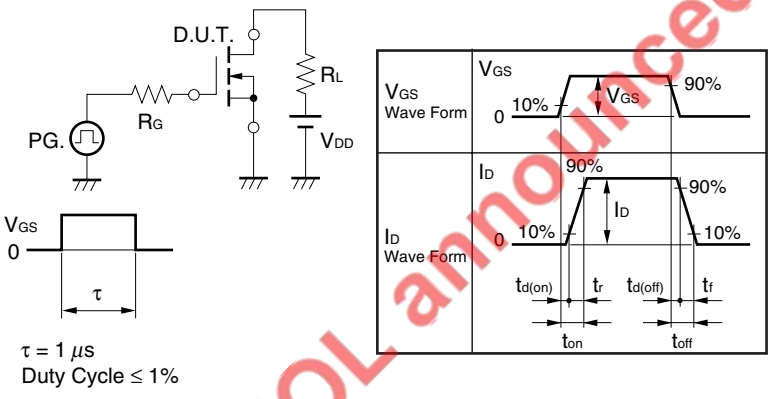
The mark ★ shows major revised points.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V			±5.0	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 5.0 V, I_D = 1.0 mA	0.8	1.0	1.6	V
Forward Transfer Admittance **Note**	$\|y_{fs}\|$	V_{DS} = 5.0 V, I_D = 0.3 A	400	550		mS
Drain to Source On-state Resistance **Note**	$R_{DS(on)1}$	V_{GS} = 2.5 V, I_D = 0.3 A		1.8	2.0	Ω
	$R_{DS(on)2}$	V_{GS} = 4.0 V, I_D = 0.3 A		0.8	1.5	Ω
Input Capacitance	C_{iss}	V_{DS} = 5.0 V		60		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		70		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		15		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 10 V, I_D = 0.3 A		95		ns
Rise Time	t_r	V_{GS} = 3.0 V		360		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		160		ns
Fall Time	t_f			150		ns

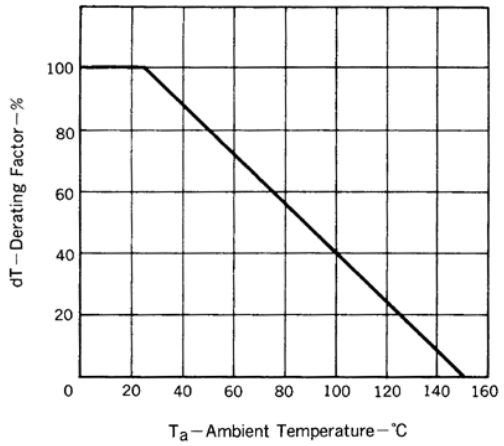
Note Pulsed

TEST CIRCUIT SWITCHING TIME

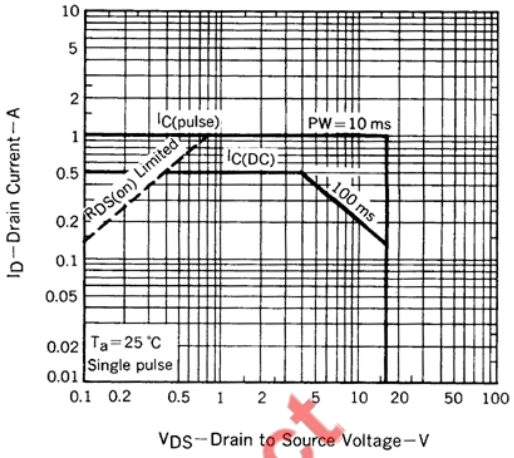


★ TYPICAL CHARACTERISTICS (T_A = 25°C)

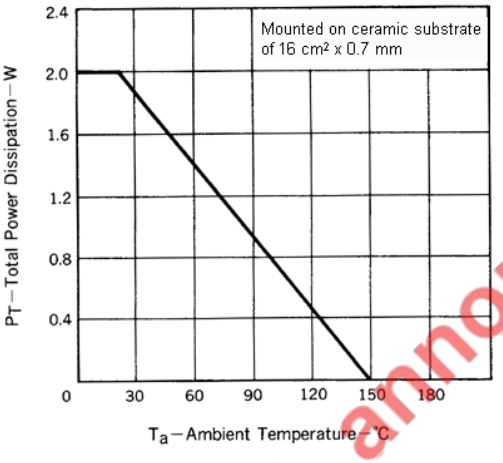
DERATING FACTOR OF FORWARD BIAS SAFE OPERATION AREA



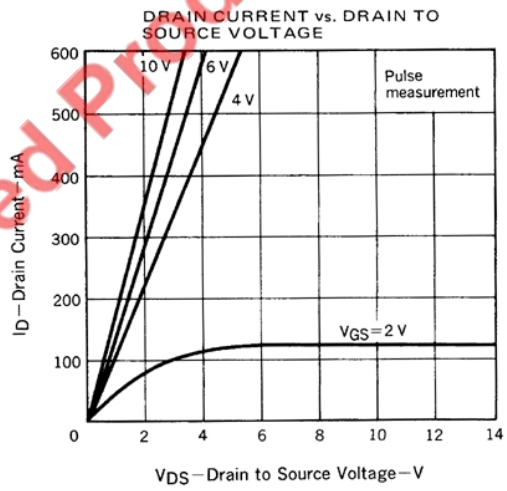
FORWARD BIAS SAFE OPERATING AREA



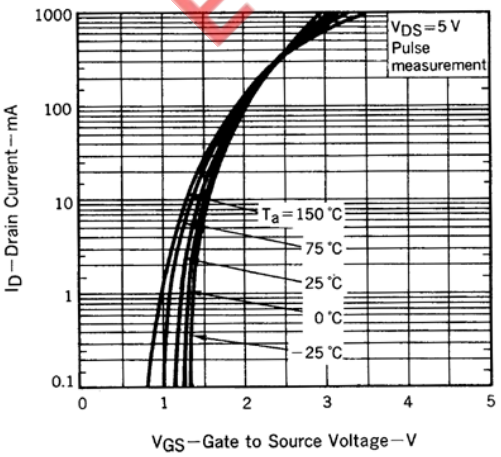
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



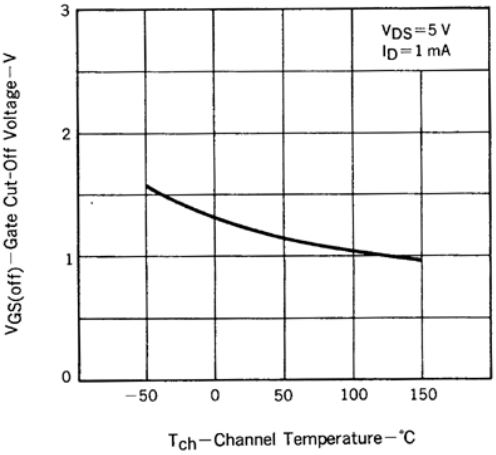
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



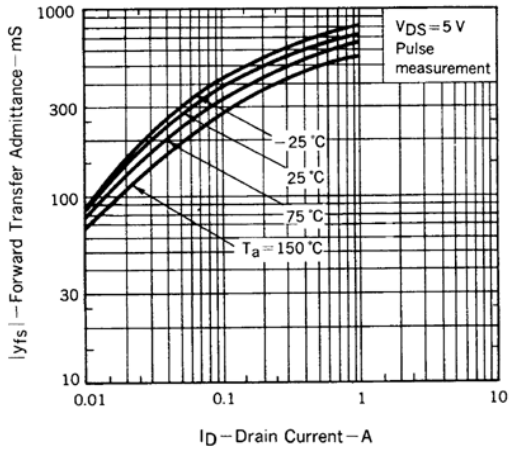
TRANSFER CHARACTERISTICS



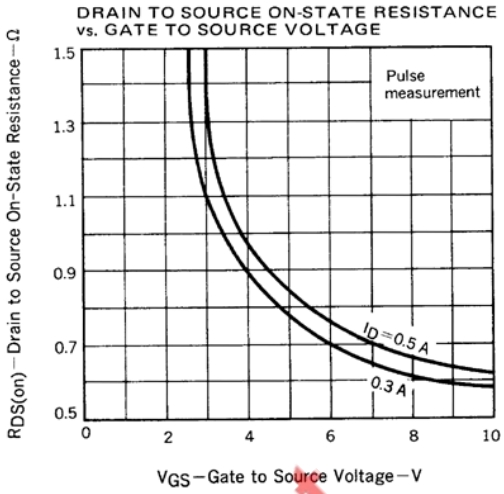
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



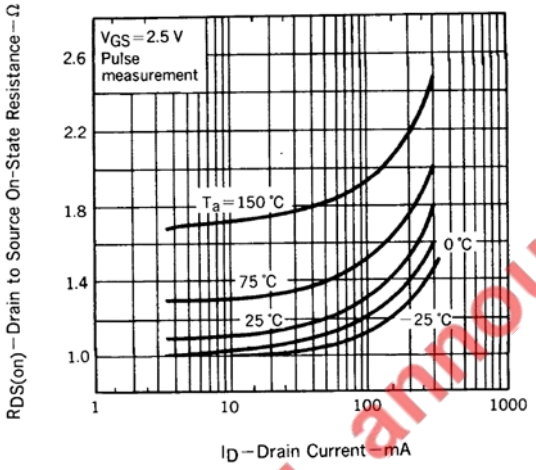
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



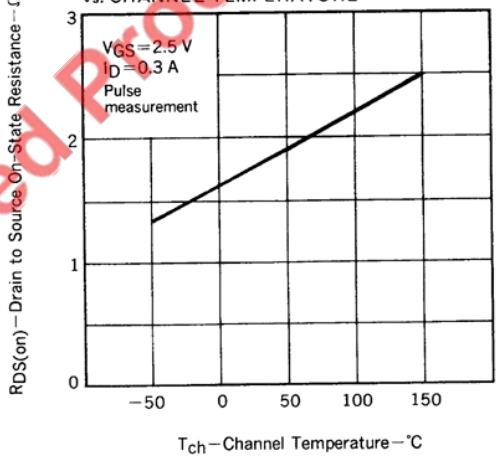
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



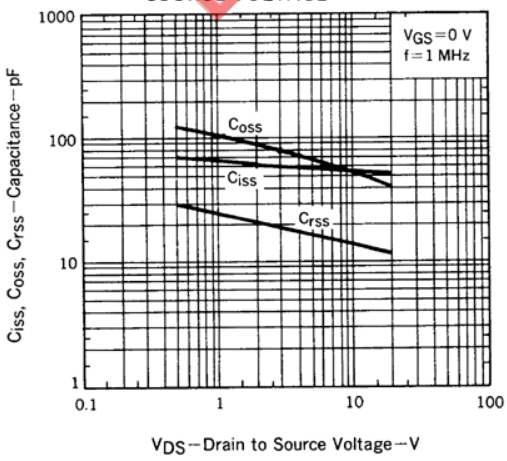
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



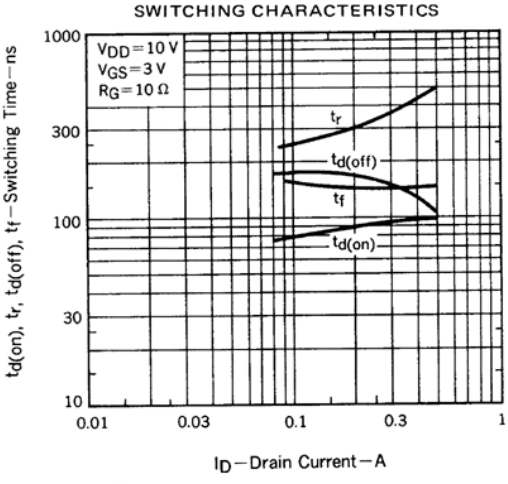
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



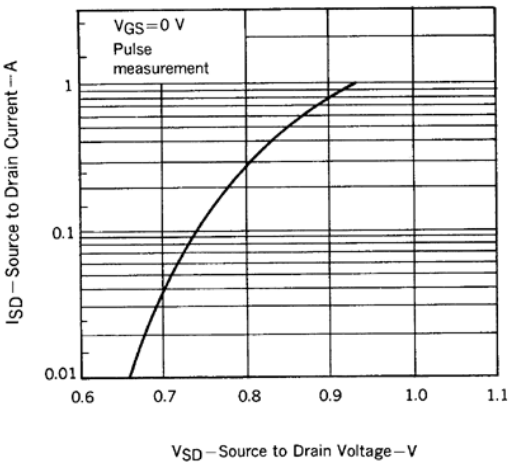
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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