

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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JUNCTION FIELD EFFECT TRANSISTOR

2SK238

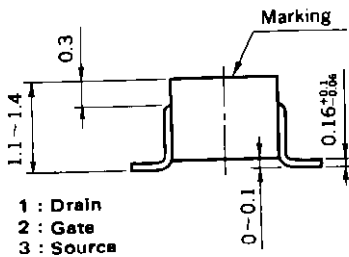
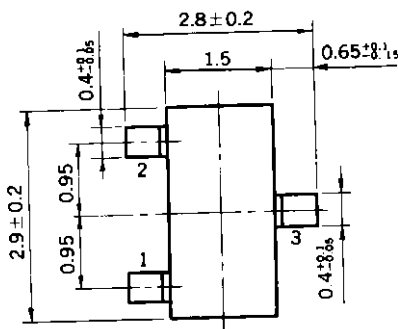
FM TUNER

N-CHANNEL SILICON JUNCTION FIELD EFFECT TRANSISTOR

MINI MOLD

PACKAGE DIMENSIONS

in millimeters



FEATURES

- Low Feedback Capacitance $C_{rss} = 0.07 \text{ pF TYP.}$
- High $|y_{fs}|$ $|y_{fs}| = 3.5 \text{ ms TYP.}$

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ($T_a = 25^\circ\text{C}$)

Gate to Drain Voltage	V_{GDO}	-20	V
Drain to Source Voltage ($V_{GS} = -2.5 \text{ V}$)	V_{DSX}	20	V
Drain Current (DC)	I_D	10	mA
Gate Current (DC)	I_G	10	mA

Maximum Power Dissipation

Total Power Dissipation at 25°C Ambient Temperature	P_T	150	mW
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Maximum Temperatures

Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +125	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Gate Cutoff Current	I_{GSS}			-100	nA	$V_{GS} = -0.5 \text{ V}, V_{DS} = 0$
Zero-Gate Voltage Drain Current	I_{DSS}	0.5	2.5	8.0	mA	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0$
Gate to Source Cutoff Voltage	$V_{GS(off)}$			-2.5	V	$V_{DS} = 5.0 \text{ V}, I_D = 10 \mu\text{A}$
Forward Transfer Admittance	$ y_{fs} _1$	2.3	3.5		mS	$V_{DS} = 5.0 \text{ V}, I_D = 0.5 \text{ mA}, f = 1.0 \text{ kHz}$
Forward Transfer Admittance	$ y_{fs} _2$	2.3			mS	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0, f = 1.0 \text{ kHz}$
Input Capacitance	C_{iss}		5.0	6.5	pF	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz}$
Feedback Capacitance	C_{rss}		0.07	0.25	pF	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz}$
Output Capacitance	C_{oss}		4.5	6.0	pF	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0, f = 1.0 \text{ MHz}$
Power Gain	G_{PS}		21		dB	$V_{DS} = 5.0 \text{ V}, V_{GS} = 0, Z_{in}, Z_{out} = 50 \Omega$
Noise Figure	NF		3.0		dB	$f = 100 \text{ MHz}$ See Test Circuits

I_{DSS} Classification

MARK	K14	K15	K16	K17
$I_{DSS}(\text{mA})$	0.5 to 1.5	1.0 to 3.0	2.0 to 6.0	4.0 to 8.0

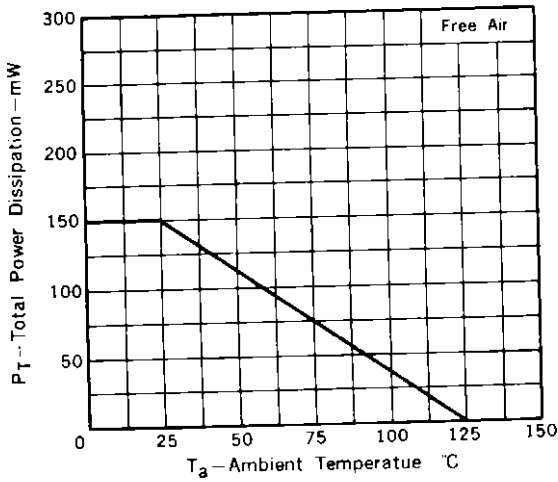
NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.

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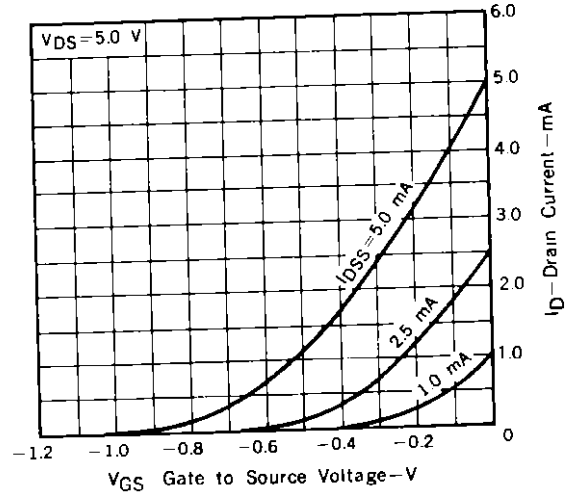
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TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

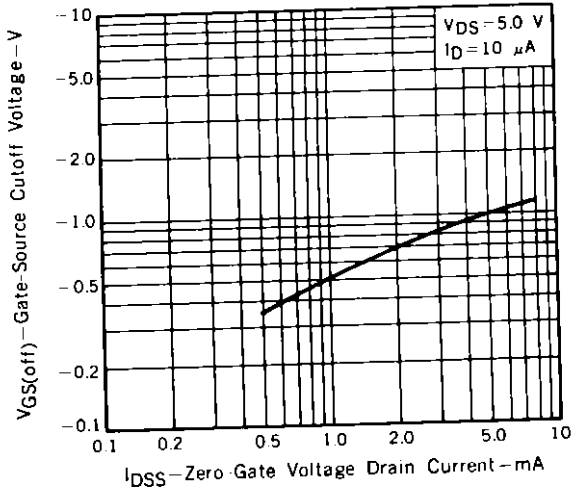
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



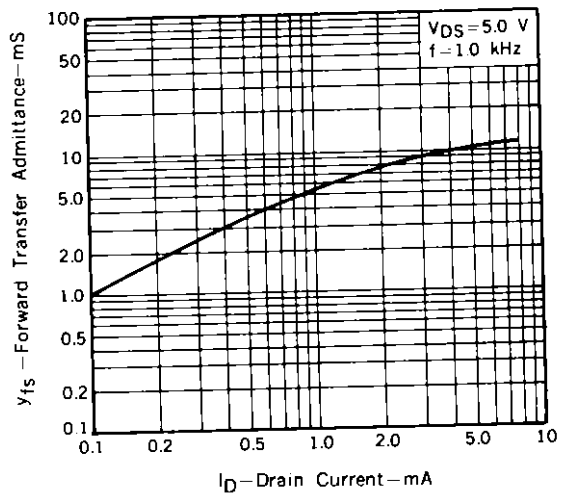
DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



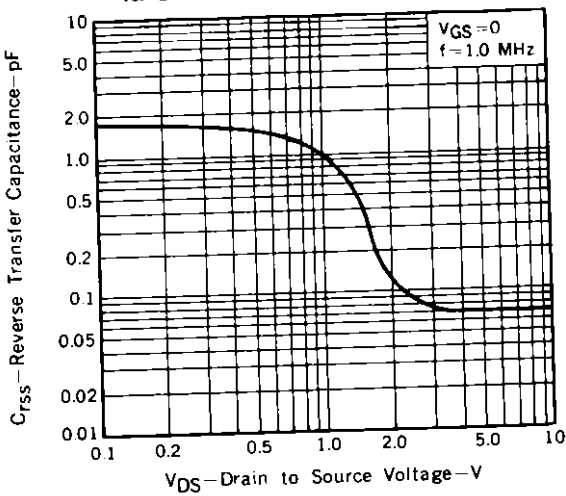
GATE-SOURCE OUTPUT VOLTAGES vs. ZERO-GATE VOLTAGE DRAIN CURRENT CORRELATION



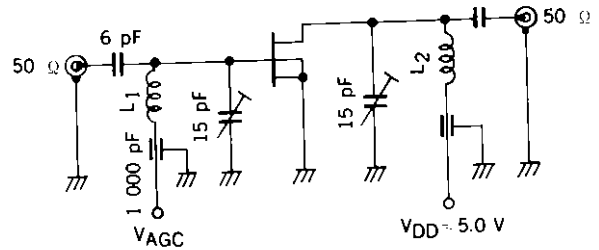
FORWARD TRANSFER ADMITTANCE (y_{fs}) vs. DRAIN CURRENT



REVERSE TRANSFER CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



NOISE FIGURE AND POWER GAIN TEST CIRCUIT ($f = 100$ MHz)





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TC-1484A
JULY-15-85M
Printed in Japan