

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**CHANNEL JUNCTION FIELD-EFFECT TRANSISTOR****Phase-out/Discontinued****2SK998****DESCRIPTION** The 2SK998 is designed for use in RF Amplifier and RF mixer.

- FEATURES**
- High Gain, High $|y_{fs}|_1$: 37 mS TYP.
($V_{DS} = 10\text{ V}$, $V_{GS} = 0$, $f = 1.0\text{ kHz}$)
 - High Frequency Wide Band Amp.

ABSOLUTE MAXIMUM RATINGS

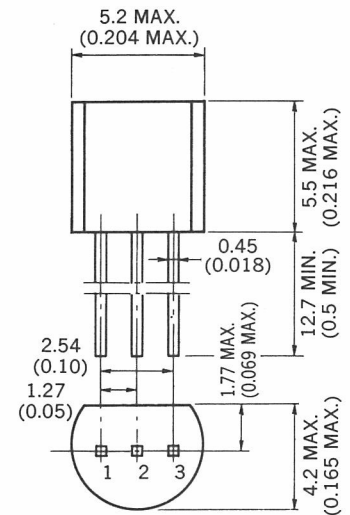
Maximum Temperature

Storage Temperature -65 to $+150\text{ }^{\circ}\text{C}$ Junction Temperature $+150\text{ }^{\circ}\text{C}$ MaximumMaximum Power Dissipation ($T_a = 25\text{ }^{\circ}\text{C}$)

Total Power Dissipation 350 mW

Maximum Voltages and Currents ($T_a = 25\text{ }^{\circ}\text{C}$) V_{GDO} Gate to Drain Voltage -20 V V_{GS} Gate to Source Voltage -10 V I_D Drain Current 35 mA I_G Gate Current 10 mA**PACKAGE DIMENSIONS**

in millimeters (inches)



1. DRAIN EIAJ : SC-43
2. SOURCE JEDEC : TO-92
3. GATE IEC : PA33

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

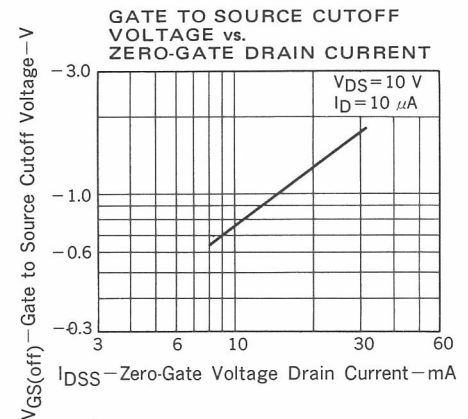
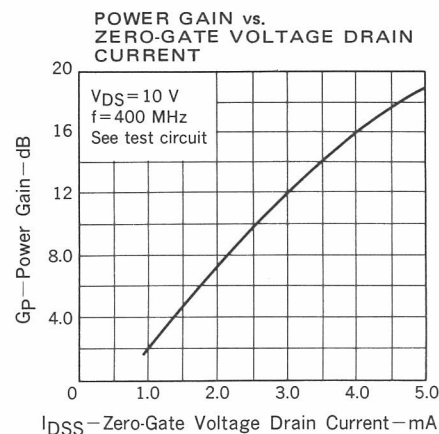
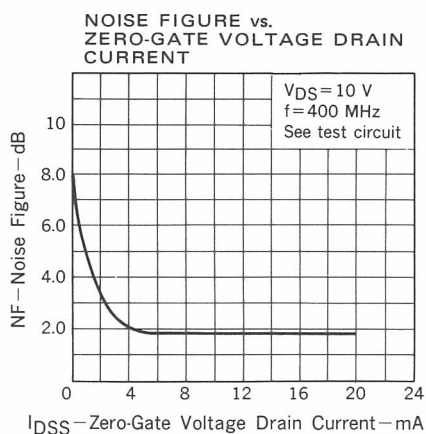
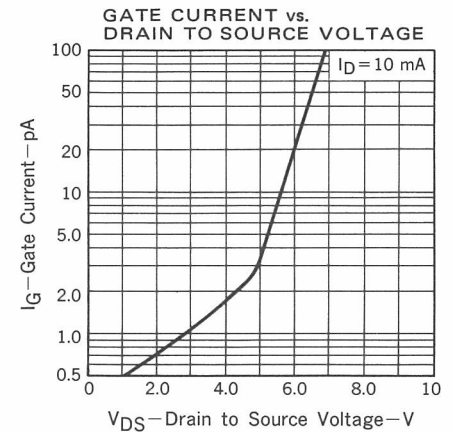
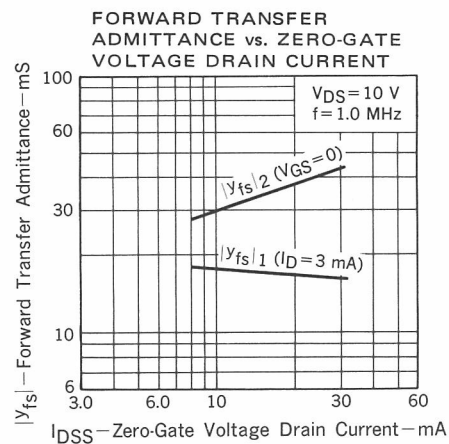
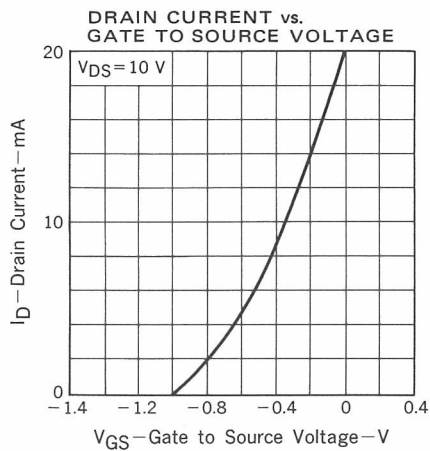
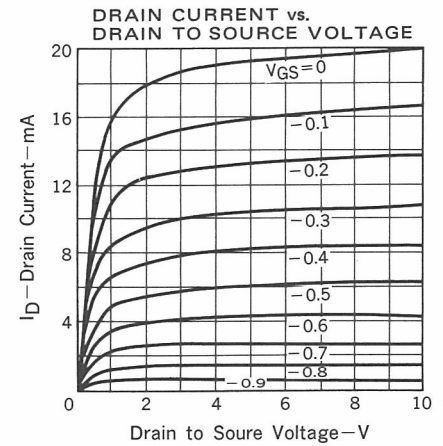
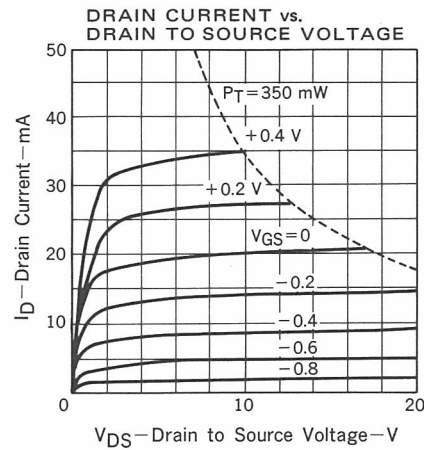
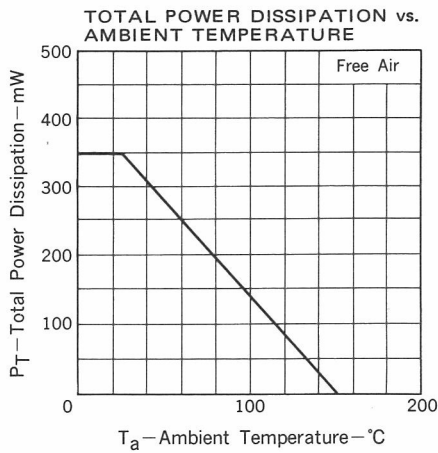
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
I_{DSS}	Zero-Gate Voltage Drain Current	8.0	20	32	mA	$V_{DS} = 10\text{ V}$, $V_{GS} = 0$
$ y_{fs} _1$	Forward Transfer Admittance	12	16		mS	$V_{DS} = 10\text{ V}$, $I_D = 3.0\text{ mA}$, $f = 1.0\text{ kHz}$
$ y_{fs} _2$	Forward Transfer Admittance		37		mS	$V_{DS} = 10\text{ V}$, $V_{GS} = 0$, $f = 1.0\text{ kHz}$
C_{iss}	Input Capacitance		8.5		pF	$V_{DS} = 10\text{ V}$, $I_D = 3\text{ mA}$, $f = 1.0\text{ MHz}$
C_{rss}	Feedback Capacitance		2.5		pF	$V_{DS} = 10\text{ V}$, $I_D = 3\text{ mA}$, $f = 1.0\text{ MHz}$
C_{oss}	Output Capacitance		3.5		pF	$V_{DS} = 10\text{ V}$, $I_D = 3\text{ mA}$, $f = 1.0\text{ MHz}$
G_{ps}	Power Gain	8	12		dB	$V_{DS} = 10\text{ V}$, $I_D = 3\text{ mA}$ $f = 400\text{ MHz}$, See test circuit
NF	Noise Figure		2.0		dB	$V_{DS} = 10\text{ V}$, $I_D = 3\text{ mA}$ $f = 400\text{ MHz}$, See test circuit
I_{GSS}	Gate Cutoff Current			-50	nA	$V_{GS} = -8.0\text{ V}$, $V_{DS} = 0$
V_{GSO}	Gate to Source Voltage	-10	-20		V	$I_G = 10\text{ }\mu\text{A}$, $I_D = 0$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	-0.35		-2.2	V	$V_{DS} = 10\text{ V}$, $I_D = 10\text{ }\mu\text{A}$

Classification of I_{DSS}

Rank	E	F	H
$I_{DSS}(\text{mA})$	8 to 16	12 to 24	16 to 32

 I_{DSS} Test Conditions: $V_{DS} = 10\text{ V}$, $V_{GS} = 0$

Phase-out/Discontinued

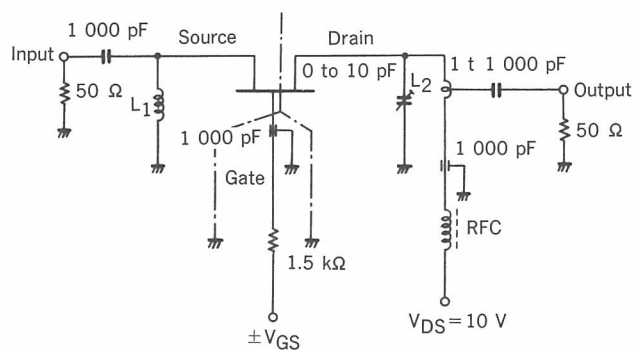
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

FEED-BACK AND INPUT CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

The graph plots capacitance in pF on a logarithmic y-axis (0.1 to 100) against drain-to-source voltage V_{DS} in Volts on a logarithmic x-axis (1 to 100). Two curves are shown: C_{iss} (Input Capacitance) and C_{rss} (Feedback Capacitance). C_{iss} starts at approximately 10 pF at 1 V and decreases slightly to about 8 pF at 20 V. C_{rss} starts at approximately 4 pF at 1 V and decreases more significantly to about 2 pF at 20 V.

V_{DS} (V)	C_{iss} (pF)	C_{rss} (pF)
1	10	4
2	9.5	3.5
5	9	3
10	8.5	2.5
20	8	2

($f = 400 \text{ MHz}$, $V_{DS} = 10 \text{ V}$)



Phase-out/Discontinued