NEC
ELECTRON DEVICE

N-CHANNEL JUNCTION FIELD-EFFECT TRANSISTOR

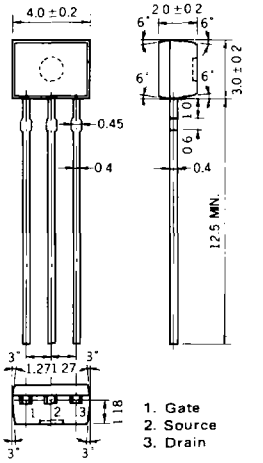
2SK193

DESCRIPTION The 2SK193 is designed for use in FM tuner of a potable radio receiver.

FEATURES

- High $|Y_{fs}|_1$: 3.5 mS TYP.
  $|Y_{fs}|_1$ (V_{DS} = 5.0 V, I_D = 0.5 mA, f = 1.0 kHz)
- Low C_{rss} : 0.07 pF TYP.
  C_{rss} (V_{DS} = 5.0 V, V_{GS} = 0)

PACKAGE DIMENSIONS
in millimeters



ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

Maximum Temperatures

- Storage Temperature . . . . . −55 to +125 °C
- Junction Temperature . . . . . +125 °C Maximum

Maximum Power Dissipation (Ta = 25 °C)

- Total Power Dissipation . . . . . 250 mW

Maximum Voltages and Currents (Ta = 25 °C)

V_{GDO}	Gate to Drain Voltage	−20	V
V_{GSO}	Gate to Source Voltage	−1.0	V
V_{DSX}*	Drain to Source Voltage	20	V
I_D	Drain Current	10	mA
I_G	Gate Current	10	mA

* V_{GS} = −2.5 V

ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
I_{DSS}	Zero-Gate Voltage Drain Current	0.5	2.5	8.0	mA	V_{DS} = 5.0 V, V_{GS} = 0
$\|Y_{fs}\|_1$	Forward Transfer Admittance	2.3	3.5		mS	V_{DS} = 5.0 V, I_D = 0.5 mA, f = 1.0 kHz
$\|Y_{fs}\|_2$	Forward Transfer Admittance	2.3	8.5		mS	V_{DS} = 5.0 V, V_{GS} = 0, f = 1.0 kHz
C_{iss}	Input Capacitance		5.0	6.5	pF	V_{DS} = 5.0 V, V_{GS} = 0, f = 1.0 MHz
C_{rss}	Feedback Capacitance		0.07	0.25	pF	V_{DS} = 5.0 V, V_{GS} = 0, f = 1.0 MHz
C_{oss}	Output Capacitance		4.5	6.0	pF	V_{DS} = 5.0 V, V_{GS} = 0, f = 1.0 MHz
G_{ps}	Power Gain	13	21		dB	V_{DS} = 5.0 V, V_{GS} = 0, Z_{in}, Z_{out} = 50 Ω f = 100 MHz, See test circuit
NF	Noise Figure		3.0	6.0	dB	V_{DS} = 5.0 V, V_{GS} = 0, Z_{in}, Z_{out} = 50 Ω f = 100 MHz, See test circuit
I_{GSS}	Gate Cutoff Current			−100	nA	V_{GS} = −0.5 V, V_{DS} = 0
$V_{GS(off)}$	Gate to Source Cutoff Voltage			−2.5	V	V_{DS} = 5.0 V, I_D = 10 μA

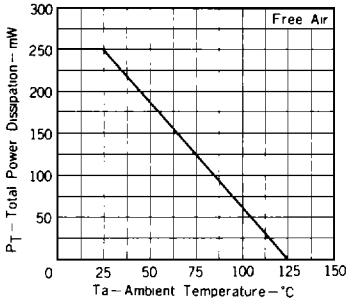
Classification of I_{DSS}

Rank	U	E	F	P	K	L	M
I_{DSS}(mA)	0.5 – 1.0	0.75 – 1.5	1.0 – 2.0	1.5 – 3.0	2.0 – 4.0	3.0 – 6.0	4.0 – 8.0

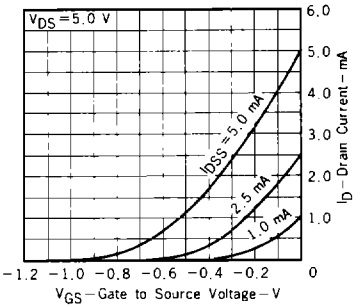
I_{DSS} Test Conditions: V_{DS} = 5.0 V, V_{GS} = 0

TYPICAL CHARACTERISTICS (Ta = 25 °C unless otherwise noted)

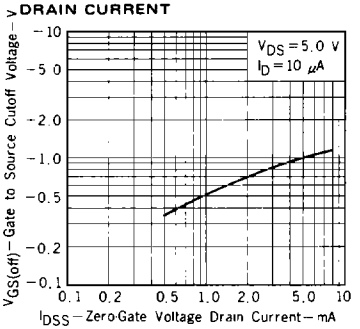
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



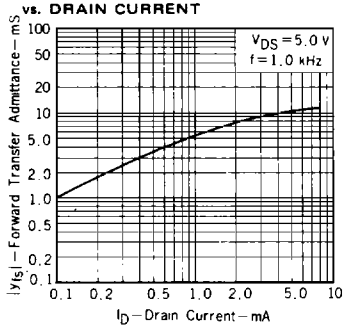
DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



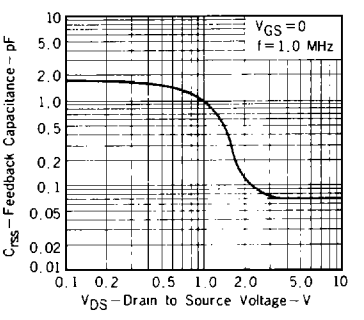
GATE TO SOURCE CUTOFF VOLTAGE vs. ZERO-GATE VOLTAGE DRAIN CURRENT



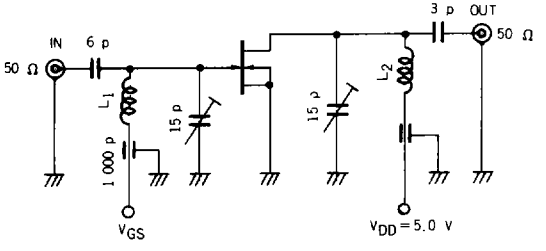
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



FEEDBACK CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



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



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