NEC
ELECTRON DEVICE

N-CHANNEL JUNCTION FIELD EFFECT TRANSISTOR

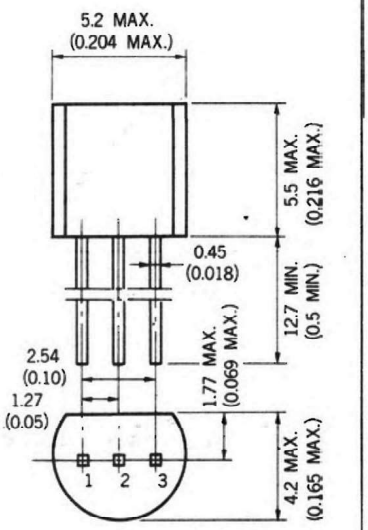
2SK68A

DESCRIPTION The 2SK68A is designed for use in driver stage of AF low noise amplifier.

FEATURES

- Low Noise Figure
  NF (V_{DS} = 10 V, V_{GS} = 0, R_G = 10 kΩ, f = 10 Hz) : 1.0 dB TYP.
- High Voltage, High $|y_{fs}|$, and Wide Dynamic Range
  V_{GDO} > −50 V, $|y_{fs}|$ (V_{DS} = 10 V, V_{GS} = 0) : 12 mS TYP.
- Low Leakage Current
  I_{GSS} < −1.0 nA (V_{GS} = −20 V)

PACKAGE DIMENSIONS
in millimeters (inches)



1. DRAIN
2. GATE
3. SOURCE

EIAJ : SC-43B
JEDEC : TO-92
IEC : PA33

ABSOLUTE MAXIMUM RATINGS

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	−50 V
V_{GSO}	Gate to Source Voltage	−50 V
V_{DSX}*	Drain to Source Voltage	50 V
I_D	Drain Current	20 mA
I_G	Gate Current	10 mA

*V_{GS} = −2.0 V

ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
I_{DSS}	Zero-Gate Voltage Drain Current	0.5	3.0	12	mA	V_{DS} = 10 V, V_{GS} = 0
$\|y_{fs}\|_1$	Forward Transfer Admittance	4.0	5.2		mS	V_{DS} = 10 V, I_D = 0.5 mA, f = 1.0 kHz
$\|y_{fs}\|_2$	Forward Transfer Admittance	4.0	12		mS	V_{DS} = 10 V, V_{GS} = 0, f = 1.0 kHz
C_{iss}	Input Capacitance		13		pF	V_{DS} = 10 V, V_{GS} = 0, f = 1.0 MHz
C_{rss}	Feedback Capacitance		2.6		pF	V_{DS} = 10 V, V_{GS} = 0, f = 1.0 MHz
NF_1	Noise Figure		5.0	10	dB	V_{DS} = 10 V, V_{GS} = 0, R_G = 1.0 kΩ, f = 10 Hz
NF_2	Noise Figure		1.0	3.0	dB	V_{DS} = 10 V, V_{GS} = 0, R_G = 1.0 kΩ, f = 100 Hz
NF_3	Noise Figure		0.6	1.5	dB	V_{DS} = 10 V, V_{GS} = 0, R_G = 1.0 kΩ, f = 1.0 kHz
NV	Noise Voltage		15	20	mV	See test circuit
I_{GSS}	Gate Cutoff Current			−1.0	nA	V_{GS} = −20 V, V_{DS} = 0
$V_{GS(off)}$	Gate to Source Cutoff Voltage	−0.13	−0.5	−1.5	V	V_{DS} = 10 V, I_D = 10 μA

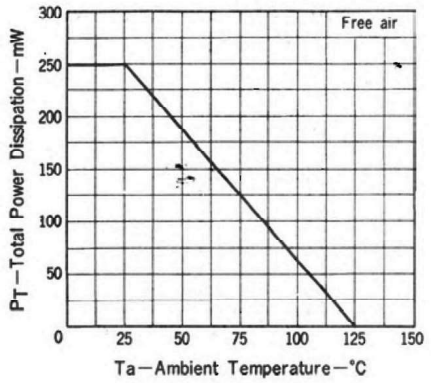
Classification of I_{DSS}

Rank	K	L	M	N
I_{DSS}(mA)	0.5 – 1.5	1.0 – 3.0	2.0 – 6.0	4.0 – 12

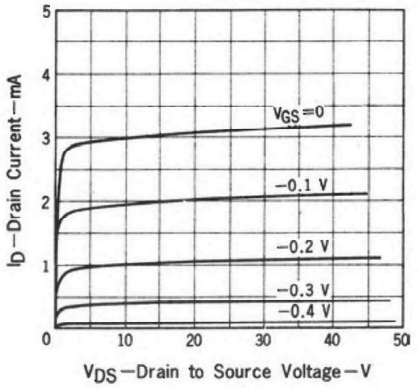
I_{DSS} Test Conditions : V_{DS} = 10 V, V_{GS} = 0

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

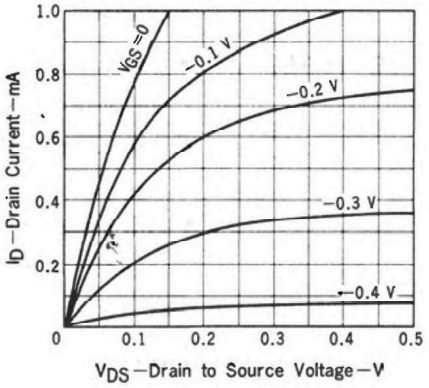
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



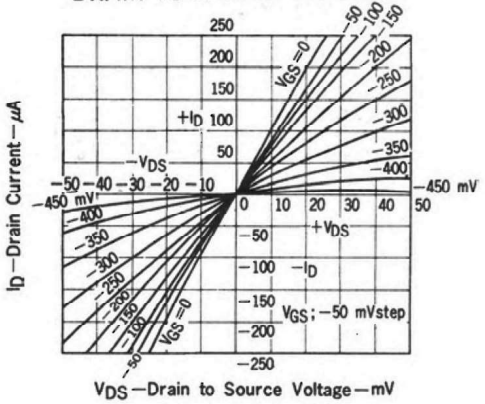
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



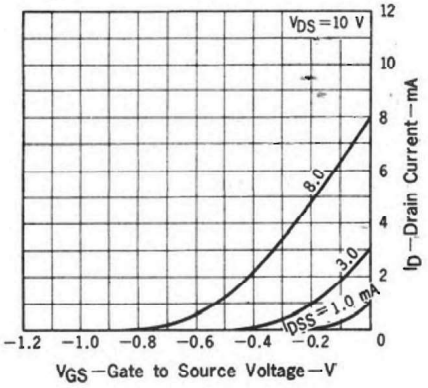
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



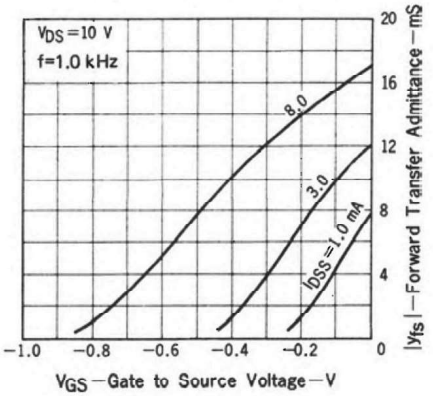
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



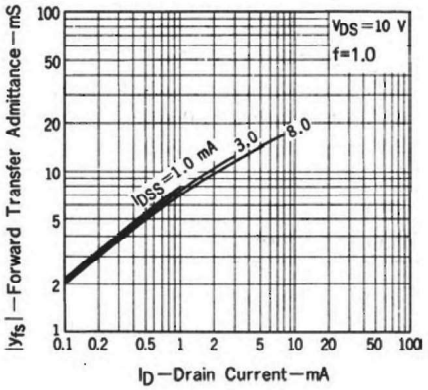
DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



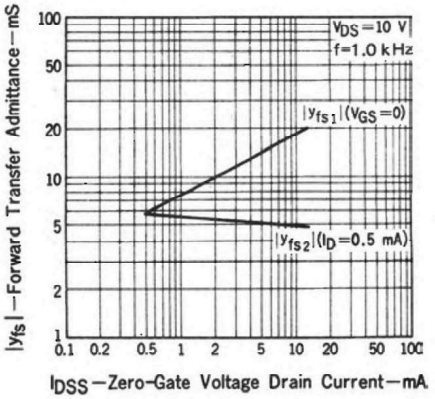
FORWARD TRANSFER ADMITTANCE vs. GATE TO SOURCE VOLTAGE



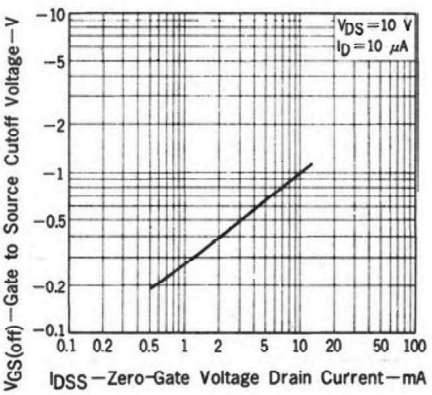
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



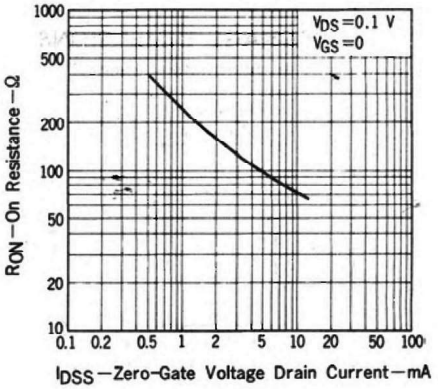
FORWARD TRANSFER ADMITTANCE vs. ZERO-GATE VOLTAGE DRAIN CURRENT



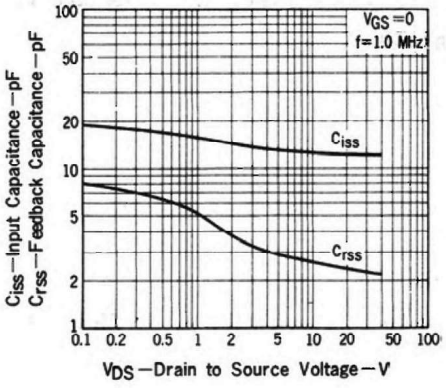
GATE TO SOURCE CUTOFF VOLTAGE vs. ZERO-GATE VOLTAGE DRAIN CURRENT



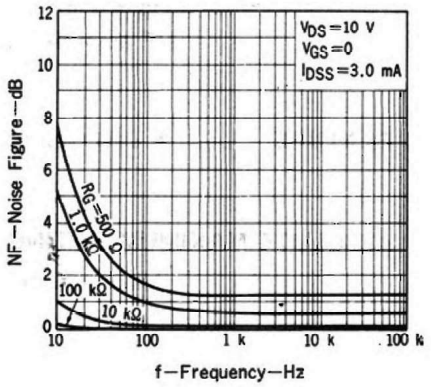
ON RESISTANCE
vs. ZERO-GATE VOLTAGE DRAIN CURRENT



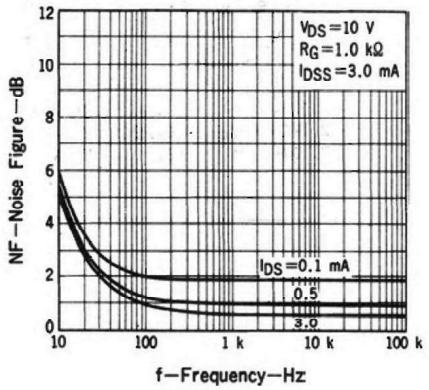
INPUT AND FEEDBACK CAPACITANCE
vs. DRAIN TO SOURCE VOLTAGE



NOISE FIGURE vs. FREQUENCY



NOISE FIGURE vs. FREQUENCY



NOISE VOLTAGE TEST CIRCUIT