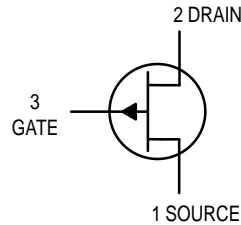
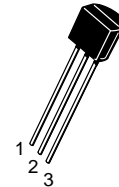


# JFET Amplifiers

## P-Channel — Depletion



**2N5460  
thru  
2N5462**



CASE 29-04, STYLE 7  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	40	Vdc
Reverse Gate-Source Voltage	$V_{GSR}$	40	Vdc
Forward Gate Current	$I_{G(f)}$	10	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature Range	$T_J$	-65 to +135	$^\circ\text{C}$
Storage Channel Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Gate-Source Breakdown Voltage ( $I_G = 10 \mu\text{Adc}$ , $V_{DS} = 0$ )	2N5460, 2N5461, 2N5462	$V_{(BR)GSS}$	40	—	—	Vdc
Gate Reverse Current ( $V_{GS} = 20 \text{ Vdc}$ , $V_{DS} = 0$ ) ( $V_{GS} = 30 \text{ Vdc}$ , $V_{DS} = 0$ )	2N5460, 2N5461, 2N5462	$I_{GSS}$	—	—	5.0	nAdc
( $V_{GS} = 20 \text{ Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ ) ( $V_{GS} = 30 \text{ Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ )	2N5460, 2N5461, 2N5462		—	—	1.0	$\mu\text{Adc}$
Gate-Source Cutoff Voltage ( $V_{DS} = 15 \text{ Vdc}$ , $I_D = 1.0 \mu\text{Adc}$ )	2N5460 2N5461 2N5462	$V_{GS(off)}$	0.75 1.0 1.8	— — —	6.0 7.5 9.0	Vdc
Gate-Source Voltage ( $V_{DS} = 15 \text{ Vdc}$ , $I_D = 0.1 \text{ mAdc}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $I_D = 0.2 \text{ mAdc}$ ) ( $V_{DS} = 15 \text{ Vdc}$ , $I_D = 0.4 \text{ mAdc}$ )	2N5460 2N5461 2N5462	$V_{GS}$	0.5 0.8 1.5	— — —	4.0 4.5 6.0	Vdc

#### ON CHARACTERISTICS

Zero-Gate-Voltage Drain Current ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$ )	2N5460 2N5461 2N5462	$I_{DSS}$	-1.0 -2.0 -4.0	— — —	-5.0 -9.0 -16	mAdc
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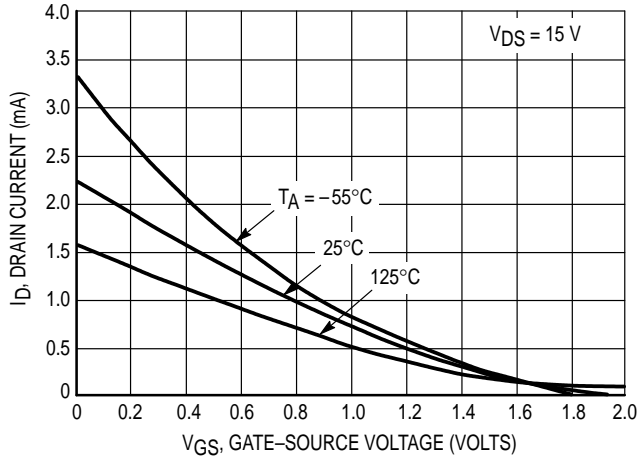
#### SMALL-SIGNAL CHARACTERISTICS

Forward Transfer Admittance ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$ )	2N5460 2N5461 2N5462	$ y_{fs} $	1000 1500 2000	— — —	4000 5000 6000	$\mu\text{mhos}$
Output Admittance ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$ )		$ y_{os} $	—	—	75	$\mu\text{mhos}$
Input Capacitance ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$ )		$C_{iss}$	—	5.0	7.0	pF
Reverse Transfer Capacitance ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ MHz}$ )		$C_{rss}$	—	1.0	2.0	pF

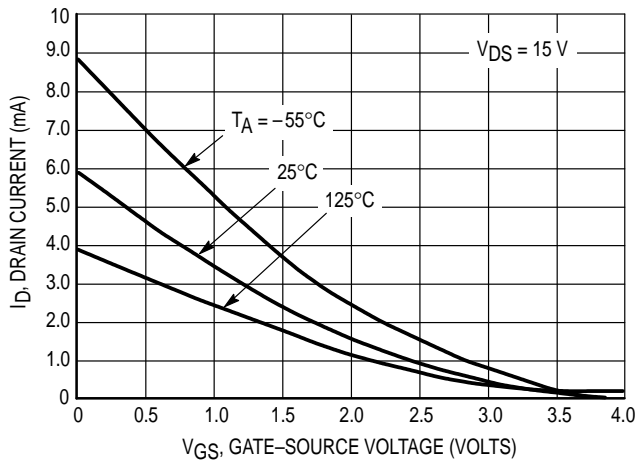
#### FUNCTIONAL CHARACTERISTICS

Noise Figure ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $R_G = 1.0 \text{ Megohm}$ , $f = 100 \text{ Hz}$ , $BW = 1.0 \text{ Hz}$ )		NF	—	1.0	2.5	dB
Equivalent Short-Circuit Input Noise Voltage ( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 100 \text{ Hz}$ , $BW = 1.0 \text{ Hz}$ )		$e_n$	—	60	115	$\text{nV}/\sqrt{\text{Hz}}$

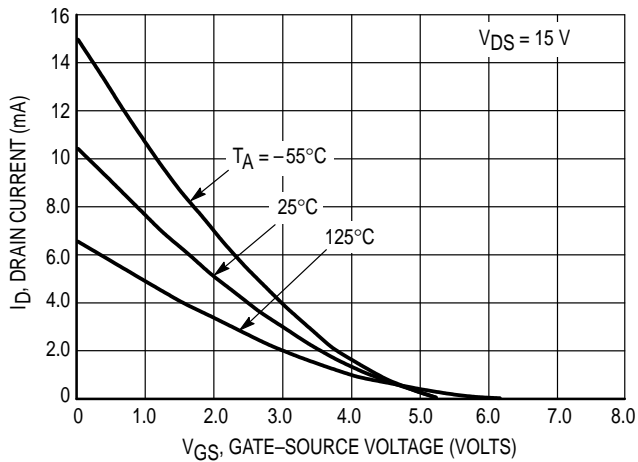
**DRAIN CURRENT versus GATE SOURCE VOLTAGE**



**Figure 1.  $V_{GS(off)} = 2.0$  Volts**

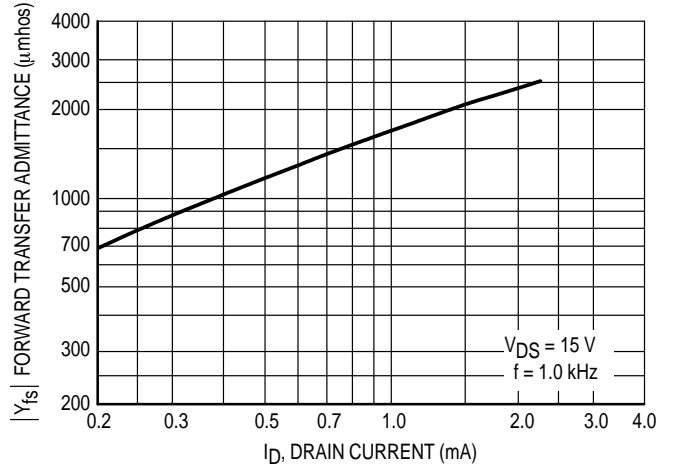


**Figure 2.  $V_{GS(off)} = 4.0$  Volts**

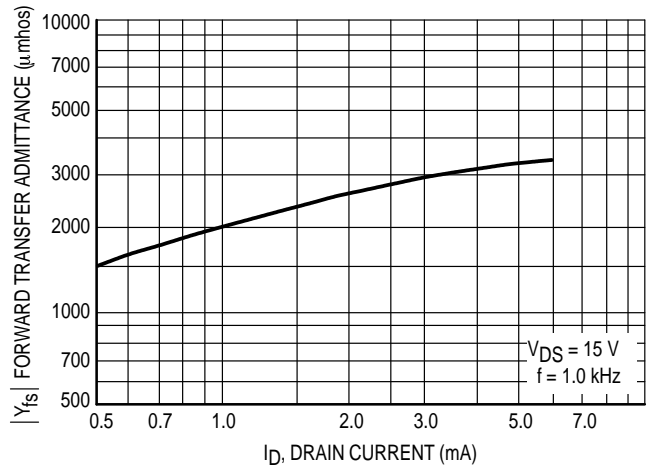


**Figure 3.  $V_{GS(off)} = 5.0$  Volts**

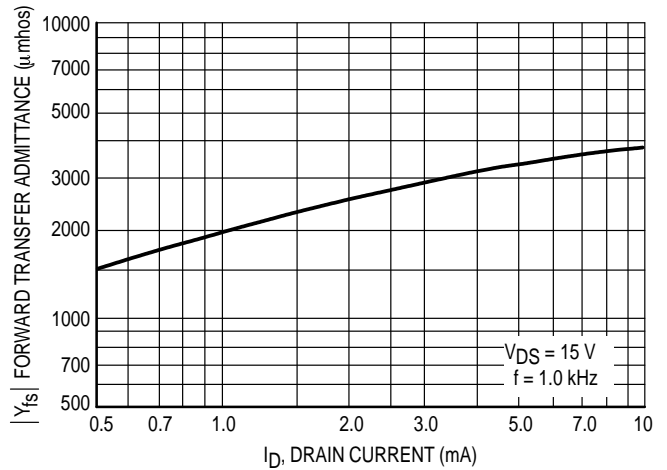
**FORWARD TRANSFER ADMITTANCE versus DRAIN CURRENT**



**Figure 4.  $V_{GS(off)} = 2.0$  Volts**



**Figure 5.  $V_{GS(off)} = 4.0$  Volts**



**Figure 6.  $V_{GS(off)} = 5.0$  Volts**

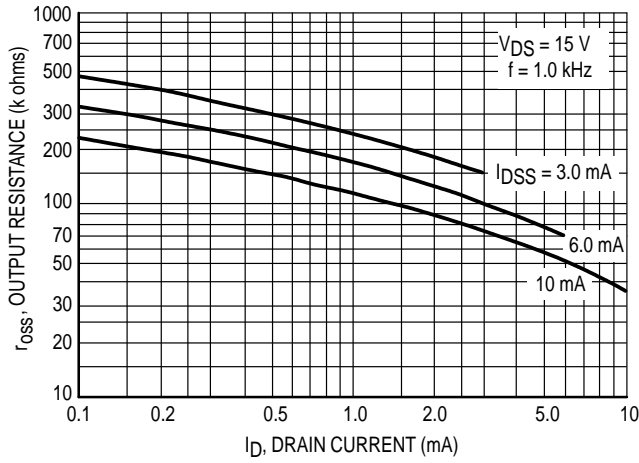


Figure 7. Output Resistance versus Drain Current

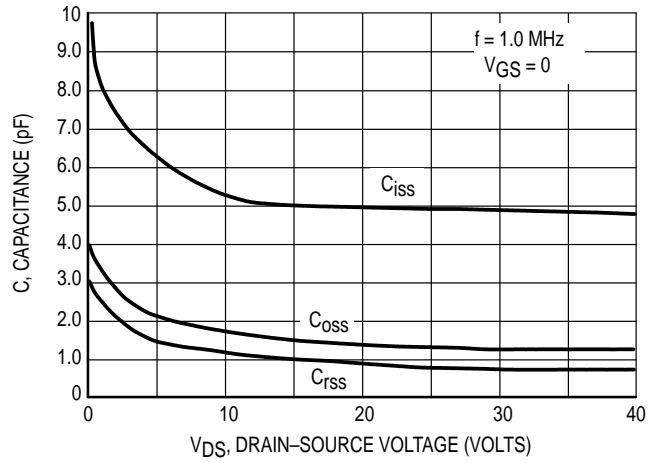


Figure 8. Capacitance versus Drain-Source Voltage

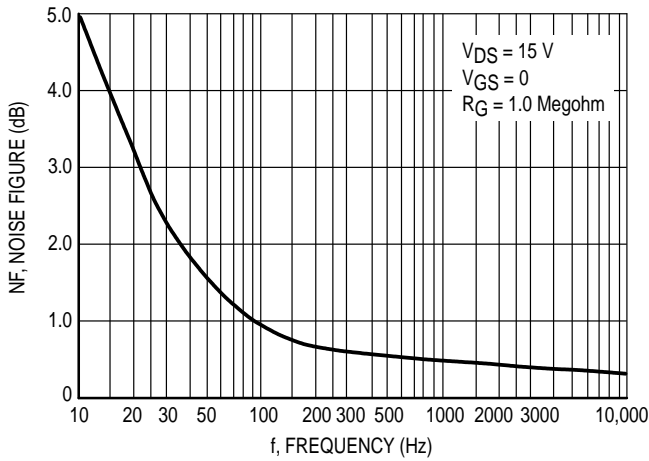


Figure 9. Noise Figure versus Frequency

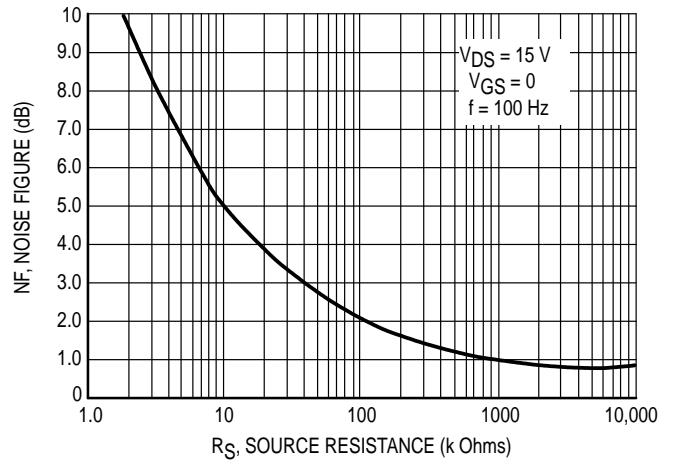
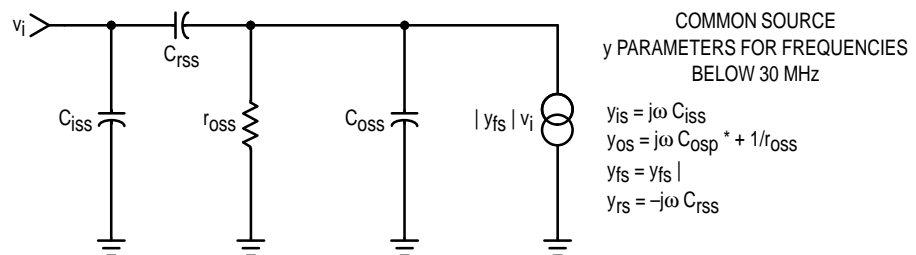


Figure 10. Noise Figure versus Source Resistance



COMMON SOURCE  
y PARAMETERS FOR FREQUENCIES  
BELOW 30 MHz

$$y_{is} = j\omega C_{iss}$$

$$y_{os} = j\omega C_{osp} + 1/r_{oss}$$

$$y_{fs} = y_{fs}$$

$$y_{rs} = -j\omega C_{rss}$$

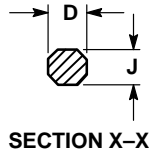
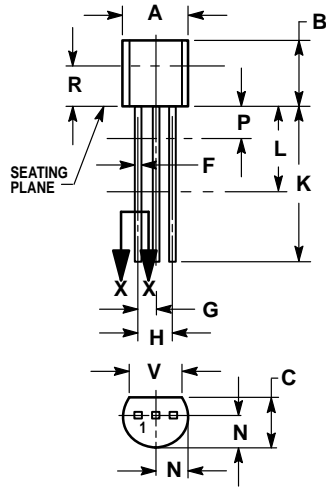
\*  $C_{osp}$  is  $C_{oss}$  in parallel with Series Combination of  $C_{iss}$  and  $C_{rss}$ .

NOTE:

- Graphical data is presented for dc conditions. Tabular data is given for pulsed conditions (Pulse Width = 630 ms, Duty Cycle = 10%).

Figure 11. Equivalent Low Frequency Circuit

PACKAGE DIMENSIONS



CASE 029-04  
(TO-226AA)  
ISSUE AD

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K. MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

STYLE 7:

1. SOURCE
2. DRAIN
3. GATE

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