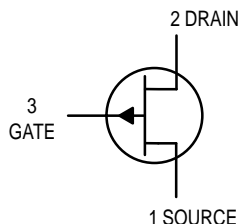
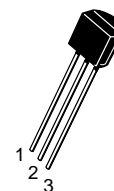


# JFET Amplifiers

## 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 @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$      | 350<br>2.8  | mW<br>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 |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

#### OFF CHARACTERISTICS

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

#### ON CHARACTERISTICS

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

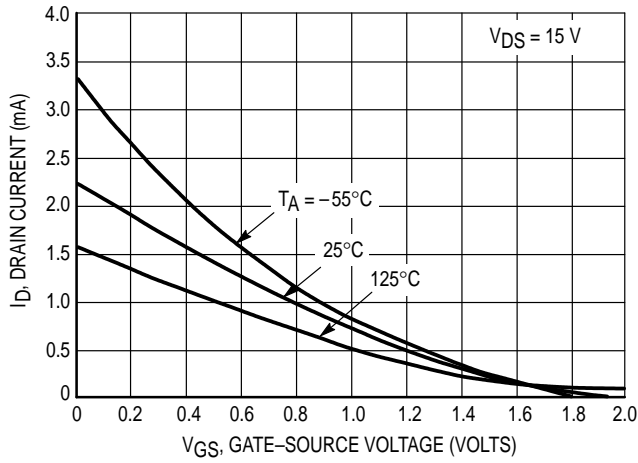
#### SMALL-SIGNAL CHARACTERISTICS

|   |                            |            |                      |             |                      |                  |
|---|----------------------------|------------|----------------------|-------------|----------------------|------------------|
| Forward Transfer Admittance<br>( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$ ) | 2N5460<br>2N5461<br>2N5462 | $ y_{fs} $ | 1000<br>1500<br>2000 | —<br>—<br>— | 4000<br>5000<br>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               |

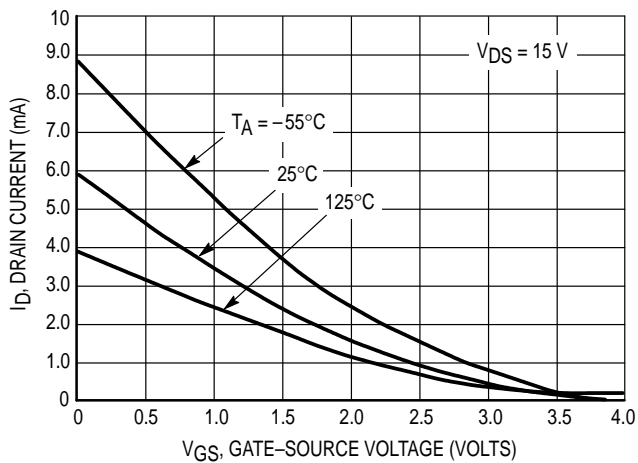
#### FUNCTIONAL CHARACTERISTICS

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

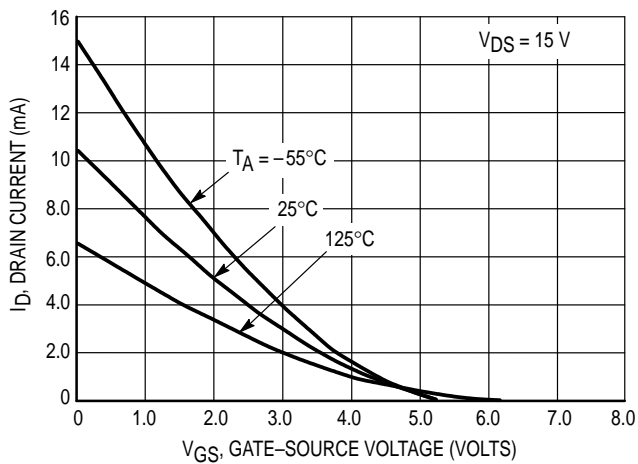
**DRAIN CURRENT versus GATE SOURCE VOLTAGE**



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

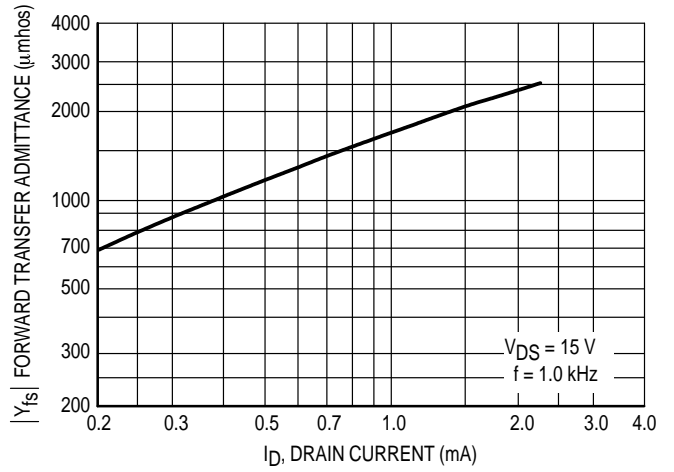


**Figure 2.  $V_{GS(off)} = 4.0$  Volts**

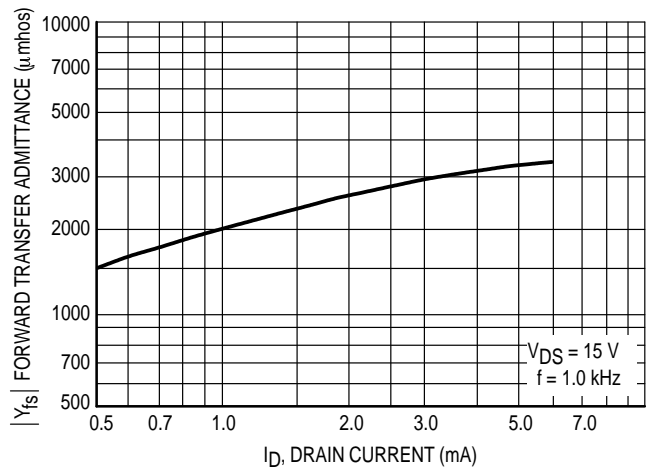


**Figure 3.  $V_{GS(off)} = 5.0$  Volts**

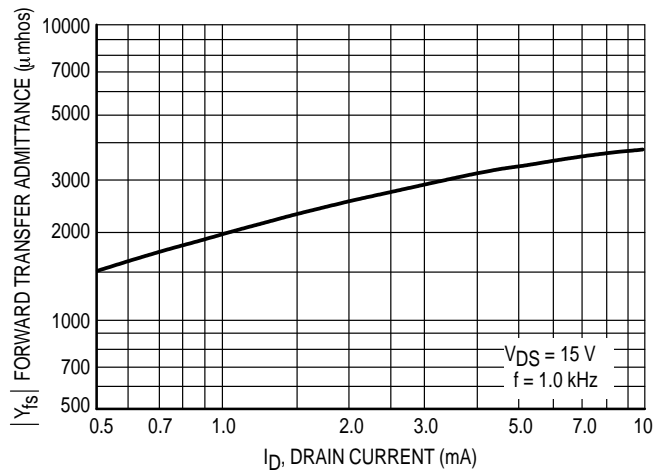
**FORWARD TRANSFER ADMITTANCE versus DRAIN CURRENT**



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



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



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

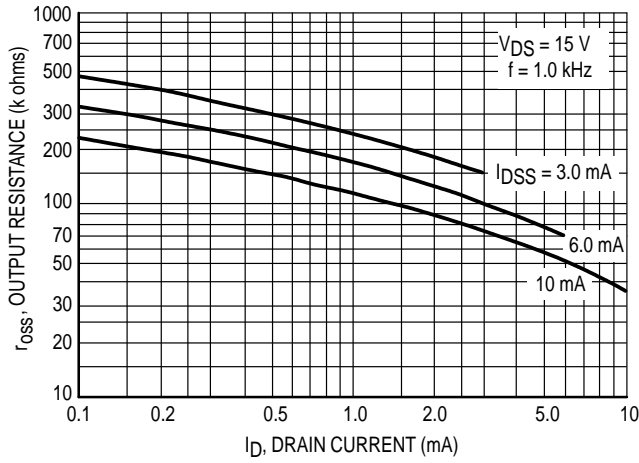


Figure 7. Output Resistance versus Drain Current

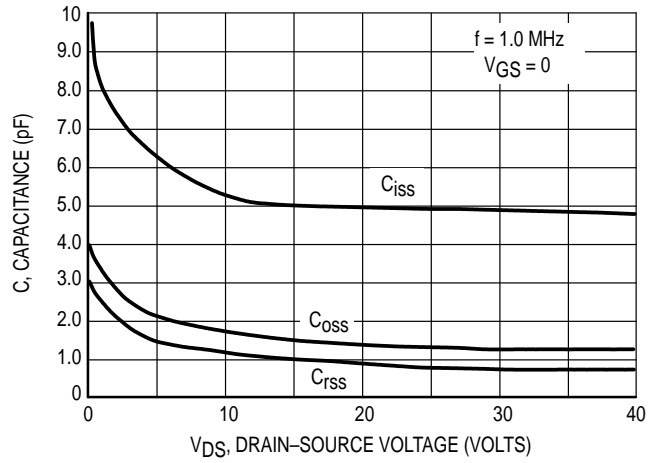


Figure 8. Capacitance versus Drain-Source Voltage

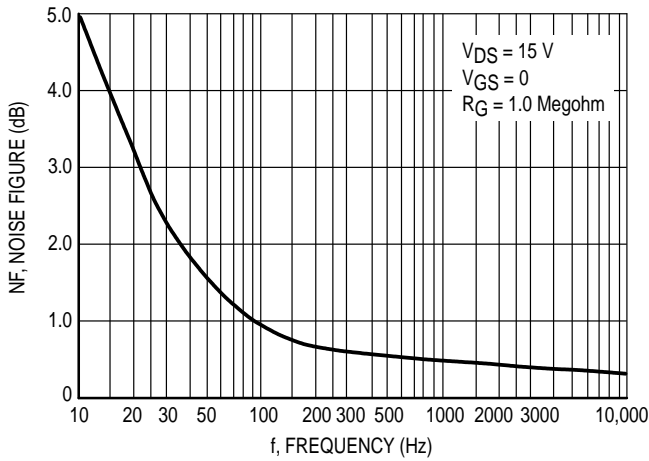


Figure 9. Noise Figure versus Frequency

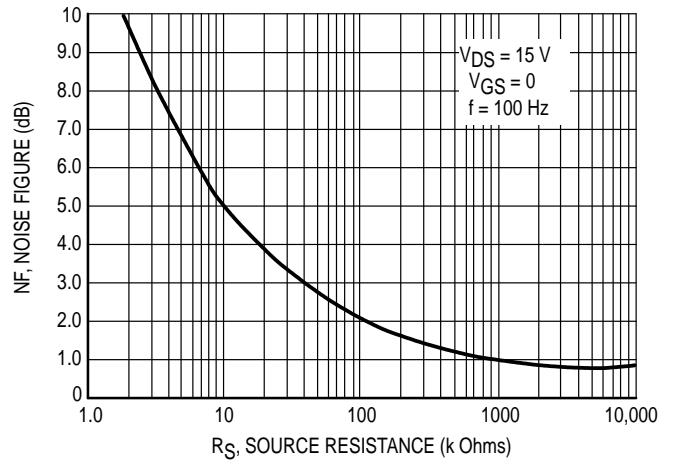
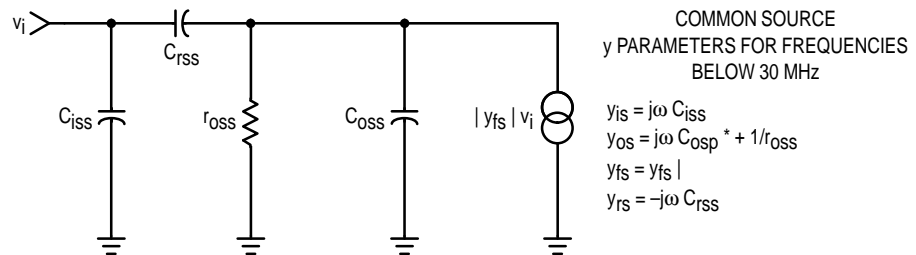


Figure 10. Noise Figure versus Source Resistance



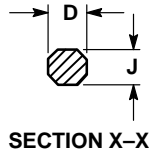
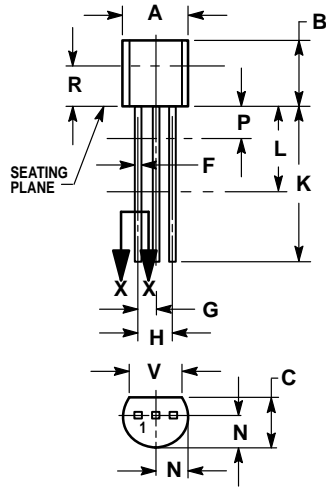
\*  $C_{osp}$  is  $C_{oss}$  in parallel with Series Combination of  $C_{iss}$  and  $C_{rss}$ .

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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