

# 2N5457, 2N5458

2N5457 and 2N5458 are Preferred Devices

## JFETs - General Purpose

### N-Channel – Depletion

N-Channel Junction Field Effect Transistors, depletion mode (Type A) designed for audio and switching applications.

- N-Channel for Higher Gain
- Drain and Source Interchangeable
- High AC Input Impedance
- High DC Input Resistance
- Low Transfer and Input Capacitance
- Low Cross-Modulation and Intermodulation Distortion
- Unibloc Plastic Encapsulated Package

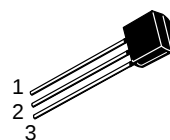
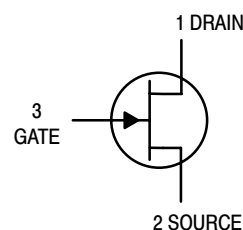
#### MAXIMUM RATINGS

| Rating                                                                                    | Symbol    | Value       | Unit                       |
|-------------------------------------------------------------------------------------------|-----------|-------------|----------------------------|
| Drain-Source Voltage                                                                      | $V_{DS}$  | 25          | Vdc                        |
| Drain-Gate Voltage                                                                        | $V_{DG}$  | 25          | Vdc                        |
| Reverse Gate-Source Voltage                                                               | $V_{GSR}$ | -25         | Vdc                        |
| Gate Current                                                                              | $I_G$     | 10          | mAdc                       |
| Total Device Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$     | 310<br>2.82 | mW<br>mW/ $^\circ\text{C}$ |
| Operating Junction Temperature                                                            | $T_J$     | 135         | $^\circ\text{C}$           |
| Storage Temperature Range                                                                 | $T_{stg}$ | -65 to +150 | $^\circ\text{C}$           |



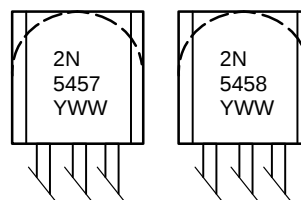
ON Semiconductor™

<http://onsemi.com>



TO-92  
CASE 29  
STYLE 5

#### MARKING DIAGRAMS



Y = Year  
WW = Work Week

#### ORDERING INFORMATION

| Device | Package | Shipping       |
|--------|---------|----------------|
| 2N5457 | TO-92   | 5000 Units/Box |
| 2N5458 | TO-92   | 5000 Units/Box |

Preferred devices are recommended choices for future use and best overall value.

# 2N5457, 2N5458

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

| Characteristic | Symbol | Min | Min | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|                                                                                                                                                                                |               |              |              |              |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|--------------|--------------|------|
| Gate-Source Breakdown Voltage<br>( $I_G = -10 \mu\text{Adc}$ , $V_{DS} = 0$ )                                                                                                  | $V_{(BR)GSS}$ | -25          | -25          | -            | Vdc  |
| Gate Reverse Current<br>( $V_{GS} = -15 \text{ Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ )<br>( $V_{GS} = -15 \text{ Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ ) | $I_{GSS}$     | -            | -            | 1.0<br>-200  | nAdc |
| Gate-Source Cutoff Voltage<br>( $V_{DS} = 15 \text{ Vdc}$ , $i_D = 1 \text{ nAdc}$ )                                                                                           | $V_{GS(off)}$ | -1.0<br>-2.0 | -            | -6.0<br>-7.0 | Vdc  |
| Gate-Source Voltage<br>( $V_{DS} = 15 \text{ Vdc}$ , $i_D = 100 \mu\text{Adc}$ )<br>( $V_{DS} = 15 \text{ Vdc}$ , $i_D = 200 \mu\text{Adc}$ )                                  | $V_{GS}$      | -<br>-       | -2.5<br>-3.5 | -6.0<br>-7.0 | Vdc  |

### ON CHARACTERISTICS

|                                                                                           |                  |           |            |            |            |      |
|-------------------------------------------------------------------------------------------|------------------|-----------|------------|------------|------------|------|
| Zero-Gate-Voltage Drain Current (Note 1.)<br>( $V_{DS} = 20 \text{ Vdc}$ , $V_{GS} = 0$ ) | 2N5638<br>2N5639 | $I_{DSS}$ | 1.0<br>2.0 | 3.0<br>6.0 | 5.0<br>9.0 | mAdc |
|-------------------------------------------------------------------------------------------|------------------|-----------|------------|------------|------------|------|

### DYNAMIC CHARACTERISTICS

|                                                                                                             |                  |            |              |              |              |                  |
|-------------------------------------------------------------------------------------------------------------|------------------|------------|--------------|--------------|--------------|------------------|
| Forward Transfer Admittance (Note 1.)<br>( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{ kHz}$ ) | 2N5638<br>2N5639 | $ Y_{fs} $ | 1000<br>1500 | 3000<br>4000 | 5000<br>5500 | $\mu\text{mhos}$ |
| Forward Transfer Admittance (Note 1.)<br>( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{ kHz}$ ) |                  | $ Y_{os} $ | -            | 10           | 50           | $\mu\text{mhos}$ |
| Input Capacitance<br>( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{ kHz}$ )                     |                  | $C_{iss}$  | -            | 4.5          | 7.0          | pF               |
| Reverse Transfer Capacitance<br>( $V_{DS} = 15 \text{ Vdc}$ , $V_{GS} = 0$ , $f = 1 \text{ kHz}$ )          |                  | $C_{rss}$  | -            | 1.5          | 3.0          | pF               |

1. Pulse Width  $\leq 630 \text{ ms}$ , Duty Cycle  $\leq 10\%$ .

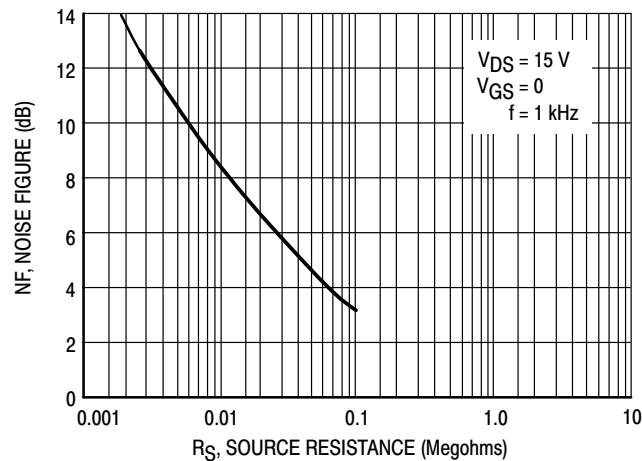


Figure 1. Noise Figure versus Source Resistance

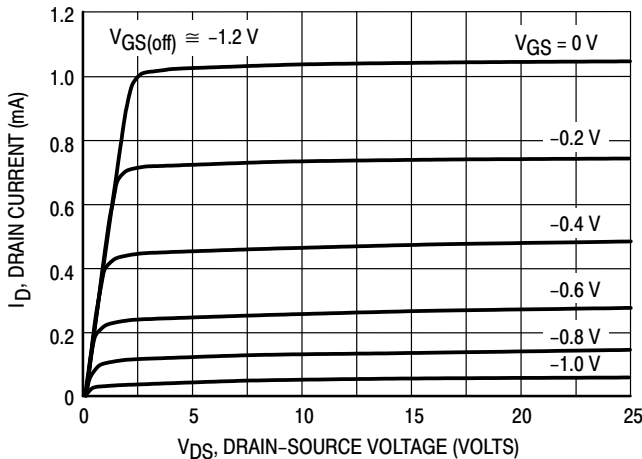


Figure 2. Typical Drain Characteristics

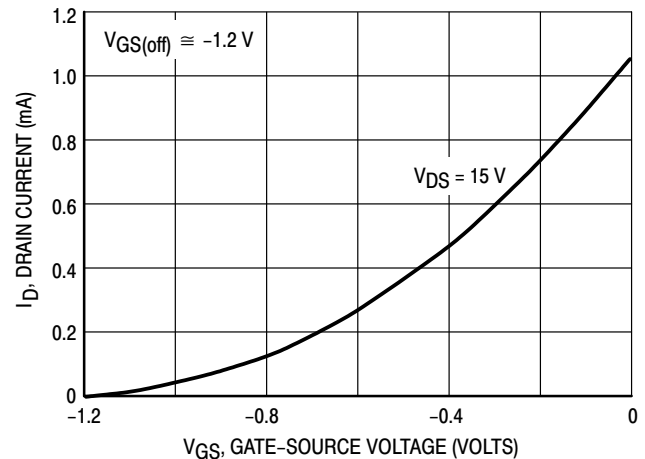


Figure 3. Common Source Transfer Characteristics

## 2N5457, 2N5458

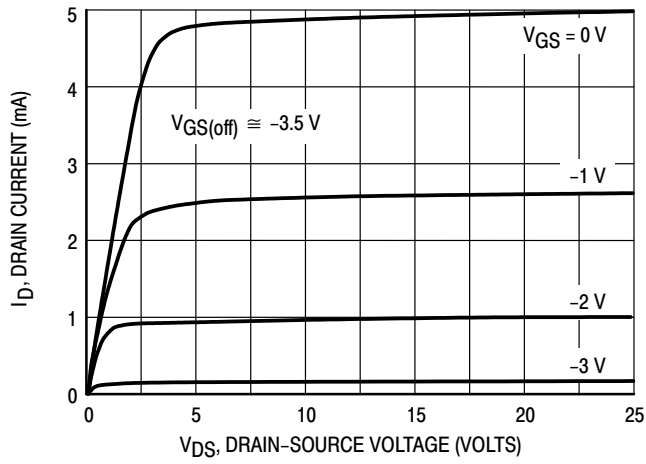


Figure 4. Typical Drain Characteristics

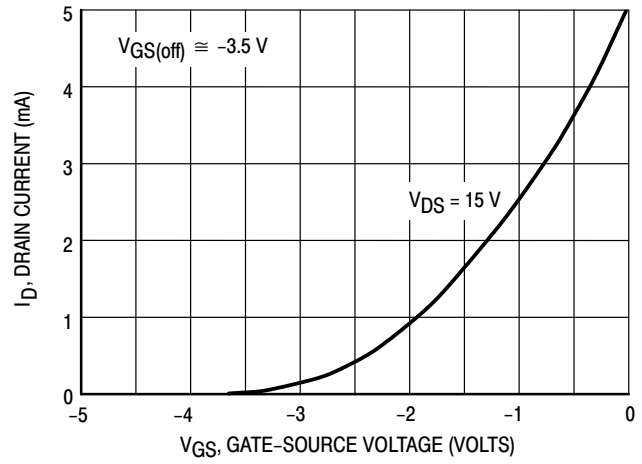


Figure 5. Common Source Transfer Characteristics

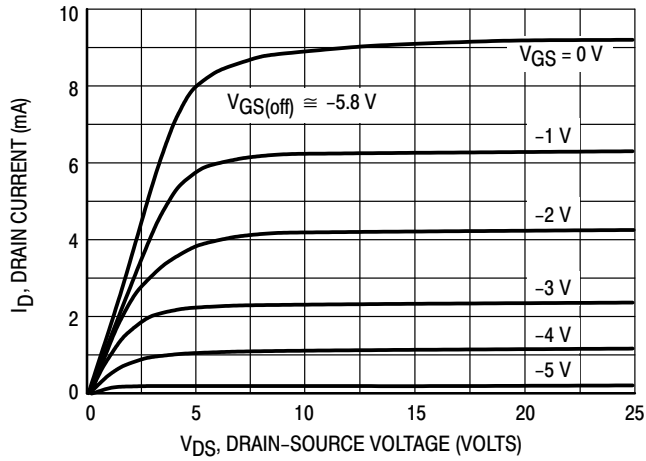


Figure 6. Typical Drain Characteristics

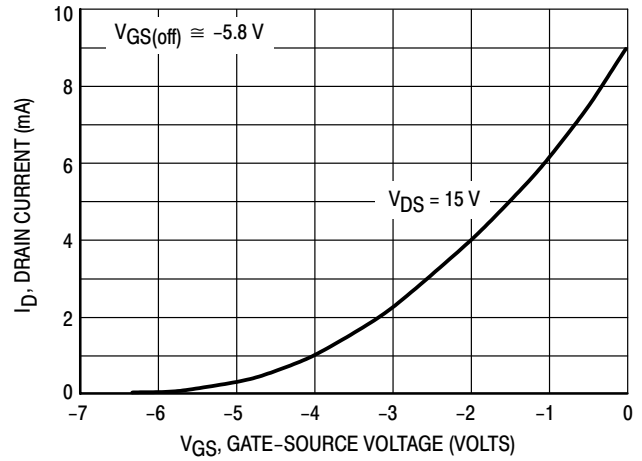


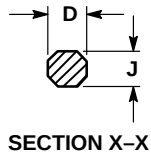
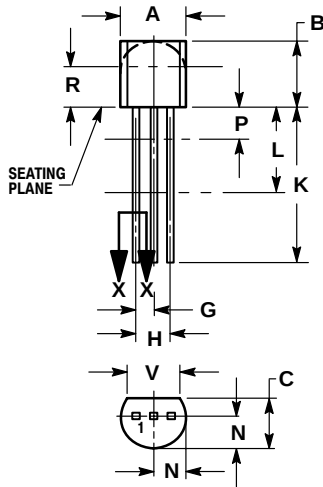
Figure 7. Common Source Transfer Characteristics

NOTE: Note: Graphical data is presented for dc conditions. Tabular data is given for pulsed conditions (Pulse Width = 630 ms, Duty Cycle = 10%). Under dc conditions, self heating in higher  $I_{DSS}$  units reduces  $I_{DSS}$ .

# 2N5457, 2N5458

## PACKAGE DIMENSIONS

### TO-92 (TO-226) CASE 29-11 ISSUE AL



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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  | 0.021 | 0.407       | 0.533 |
| 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        | ---   |

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