

# J110

## JFET - General Purpose

### N-Channel – Depletion

N-Channel Junction Field Effect Transistors, depletion mode (Type A) designed for general purpose audio amplifiers, analog switches and choppers.

#### Features

- N-Channel for Higher Gain
- Drain and Source Interchangeable
- High AC Input Impedance
- High DC Input Resistance
- Low  $R_{DS(on)} < 18 \Omega$
- Fast Switching  $t_{d(on)} + t_r = 8.0 \text{ ns (Typ)}$
- Low Noise  $\bar{e}_n = 6.0 \text{ nV}/\sqrt{\text{Hz}} @ 10 \text{ Hz (Typ)}$
- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

| Rating                                                                                    | Symbol    | Value       | Unit                       |
|-------------------------------------------------------------------------------------------|-----------|-------------|----------------------------|
| Gate-Source Voltage                                                                       | $V_{GS}$  | -25         | Vdc                        |
| Drain-Gate Voltage                                                                        | $V_{DG}$  | -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 Temp Range                                                             | $T_J$     | 135         | $^\circ\text{C}$           |
| Storage Temperature Range                                                                 | $T_{stg}$ | -65 to +150 | $^\circ\text{C}$           |

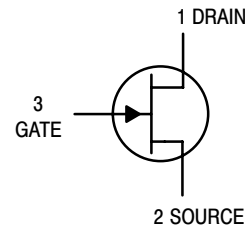
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

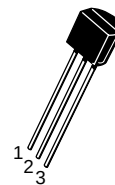


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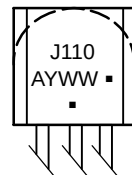
<http://onsemi.com>



#### MARKING DIAGRAM



**CASE 29  
TO-92 (TO-226)  
STYLE 5**



J110 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device    | Package            | Shipping <sup>†</sup> |
|-----------|--------------------|-----------------------|
| J110      | TO-92              | 1000 Units / Box      |
| J110G     | TO-92<br>(Pb-Free) | 1000 Units / Box      |
| J110RLRA  | TO-92              | 2000 / Tape & Reel    |
| J110RLRAG | TO-92<br>(Pb-Free) | 2000 / Tape & Reel    |

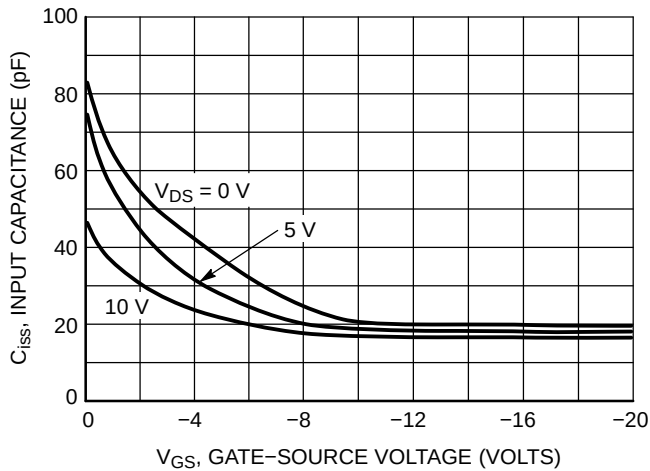
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

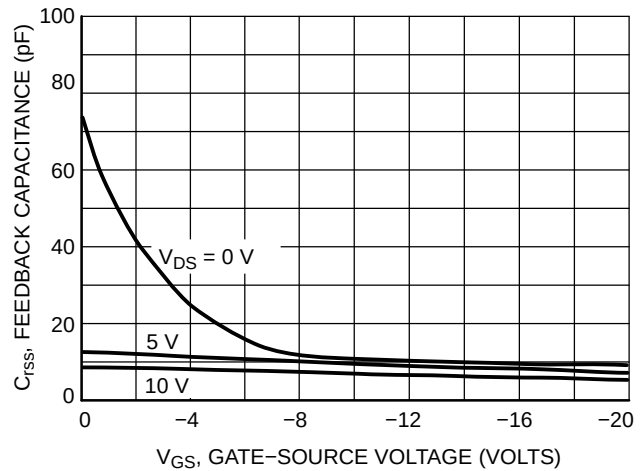
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Characteristic                                                                                                                                     | Symbol                    | Min  | Max          | Unit     |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------|--------------|----------|
| <b>STATIC CHARACTERISTICS</b>                                                                                                                      |                           |      |              |          |
| Gate–Source Breakdown Voltage<br>( $I_G = -1.0\ \mu\text{Adc}$ )                                                                                   | $V_{(BR)GSS}$             | -25  | –            | Vdc      |
| Gate Reverse Current<br>( $V_{GS} = -15\ \text{Vdc}$ , $V_{DS} = 0$ )<br>( $V_{GS} = -15\ \text{Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ ) | $I_{GSS}$                 | –    | -3.0<br>-200 | nAdc     |
| Gate–Source Cutoff Voltage<br>( $V_{DS} = 5.0\ \text{Vdc}$ , $I_D = 1.0\ \mu\text{Adc}$ )                                                          | $V_{GS(off)}$             | -0.5 | -4.0         | Vdc      |
| Drain Source On–Resistance<br>( $V_{DS} \leq 0.1\ \text{V}$ , $V_{GS} = 0\ \text{V}$ )                                                             | $R_{DS(on)}$              | –    | 18           | $\Omega$ |
| Zero–Gate–Voltage Drain Current (Note 1)<br>( $V_{DS} = 15\ \text{Vdc}$ )                                                                          | $I_{DSS}$                 | 10   | –            | mAdc     |
| <b>DYNAMIC CHARACTERISTICS</b>                                                                                                                     |                           |      |              |          |
| Drain–Gate and Source–Gate On–Capacitance<br>( $V_{DS} = V_{GS} = 0$ , $f = 1.0\ \text{MHz}$ )                                                     | $C_{dg(on)} + C_{sg(on)}$ | –    | 85           | pF       |
| Drain–Gate Off–Capacitance<br>( $V_{GS} = -10\ \text{Vdc}$ , $f = 1.0\ \text{MHz}$ )                                                               | $C_{dg(off)}$             | –    | 15           | pF       |
| Source–Gate Off–Capacitance<br>( $V_{GS} = -10\ \text{Vdc}$ , $f = 1.0\ \text{MHz}$ )                                                              | $C_{sg(off)}$             | –    | 15           | pF       |

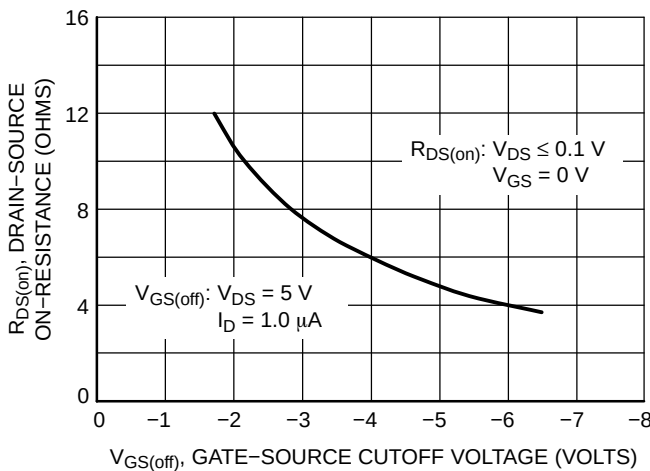
1. Pulse Width = 300  $\mu\text{s}$ , Duty Cycle = 3.0%.



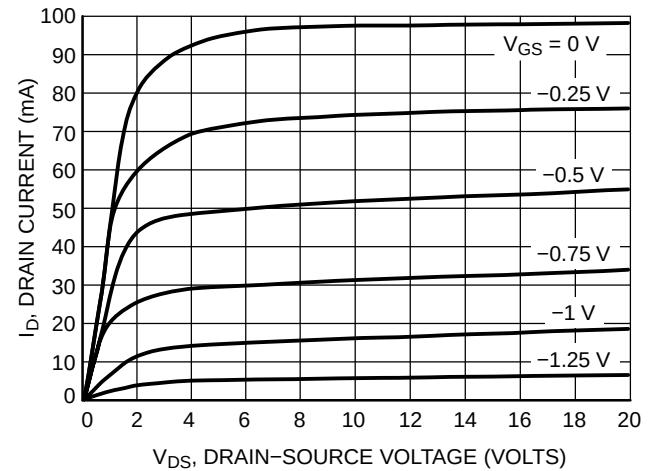
**Figure 1. Common Source Input Capacitance versus Gate–Source Voltage**



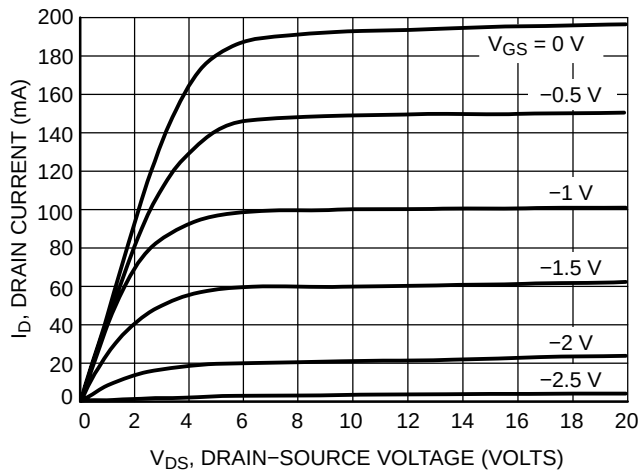
**Figure 2. Common Source Reverse Feedback Capacitance versus Gate–Source Voltage**



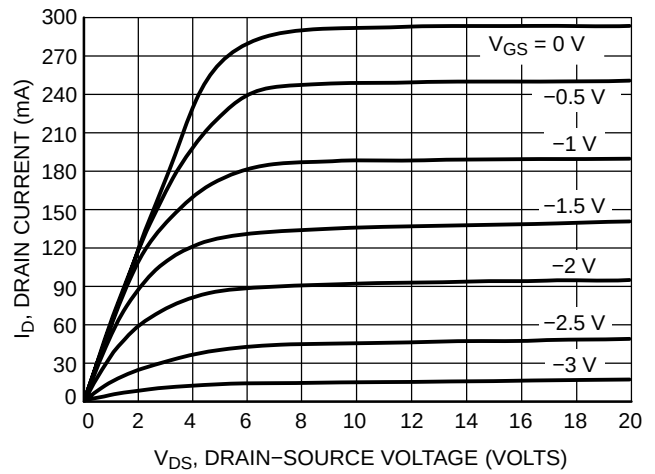
**Figure 3. On–Resistance versus Gate–Source Cutoff Voltage**



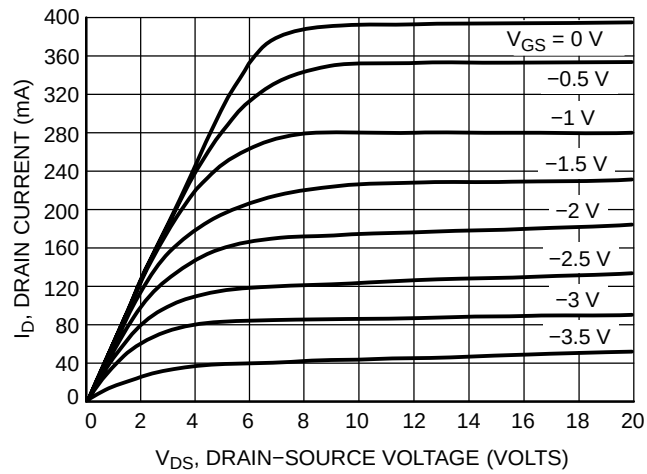
**Figure 4. Output Characteristic**  
 $V_{GS(off)} = -2.0\ \text{V}$



**Figure 5. Output Characteristic**  
 $V_{GS(off)} = -3.0\text{ V}$



**Figure 6. Output Characteristic**  
 $V_{GS(off)} = -4.0\text{ V}$

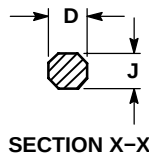
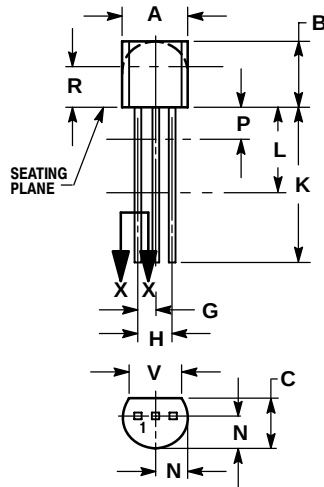


**Figure 7. Output Characteristic**  
 $V_{GS(off)} = -5.0\text{ V}$

# J110

## 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        | ---   |

### STYLE 5:

- PIN 1: DRAIN  
2. SOURCE  
3. GATE

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