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## Is Now

# onsemi™

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# 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 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	310 2.82	mW mW/ $^\circ\text{C}$
Operating Junction Temp Range	$T_J$	135	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$

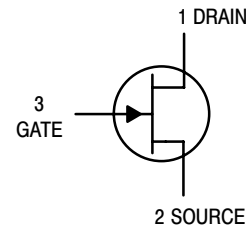
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

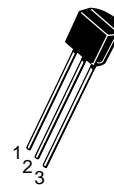


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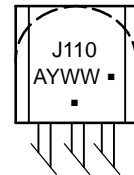
<http://onsemi.com>



#### 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†
J110	TO-92	1000 Units / Box
J110G	TO-92 (Pb-Free)	1000 Units / Box
J110RLRA	TO-92	2000 / Tape & Reel
J110RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel

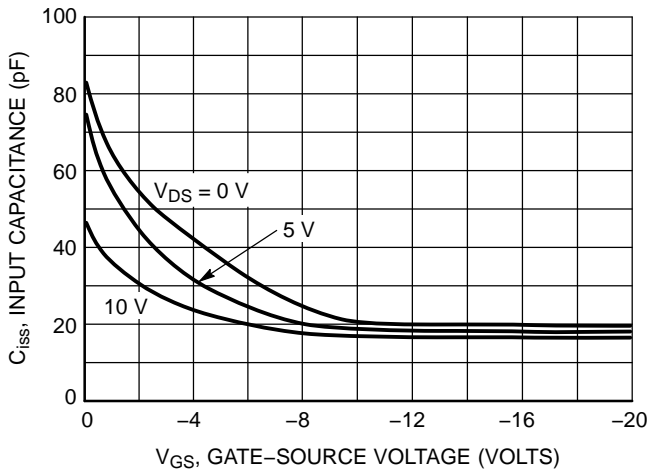
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

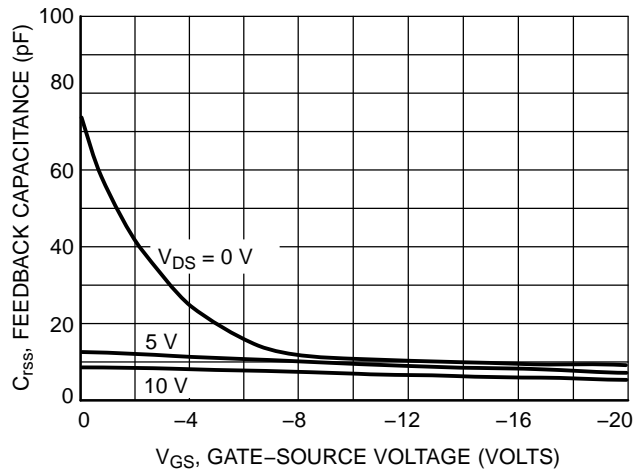
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

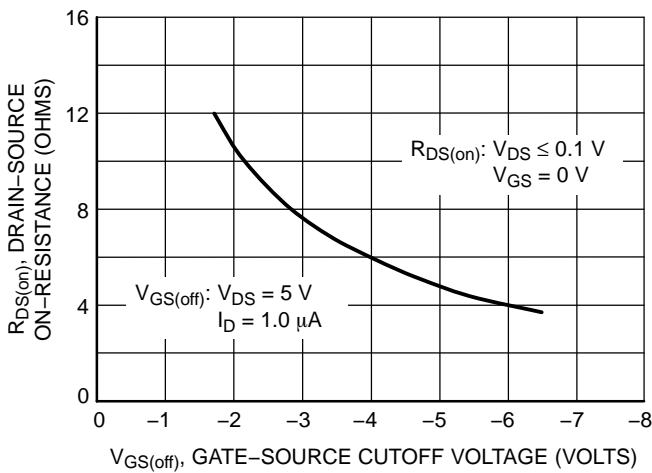
1. Pulse Width = 300  $\mu\text{s}$ , Duty Cycle = 3.0%.



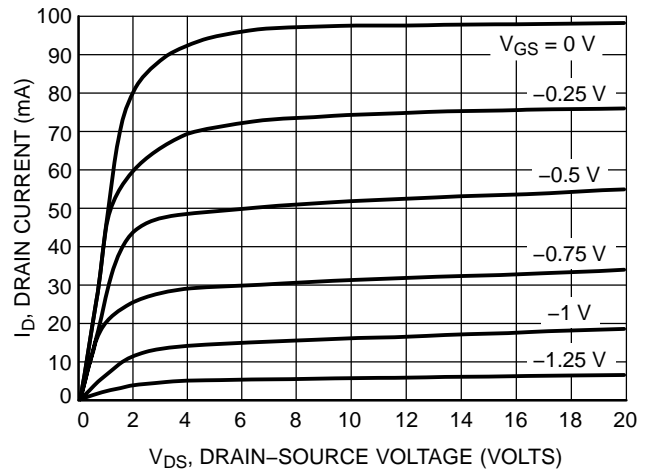
**Figure 1. Common Source Input Capacitance versus Gate-Source Voltage**



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

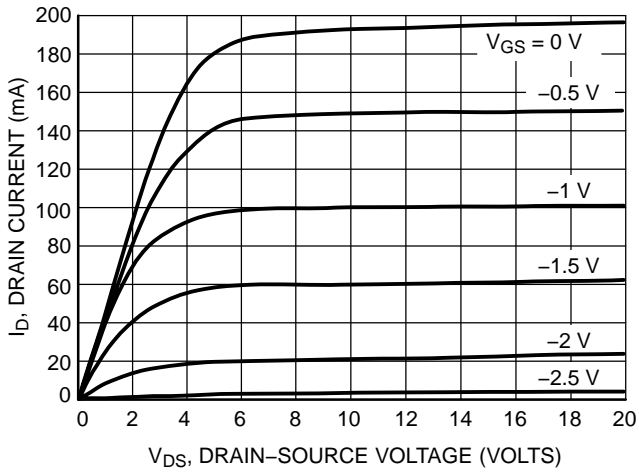


**Figure 3. On-Resistance versus Gate-Source Cutoff Voltage**

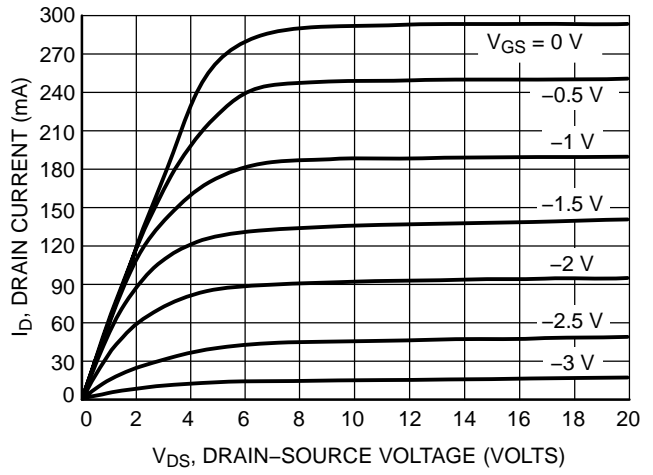


**Figure 4. Output Characteristic  $V_{GS(off)} = -2.0 \text{ V}$**

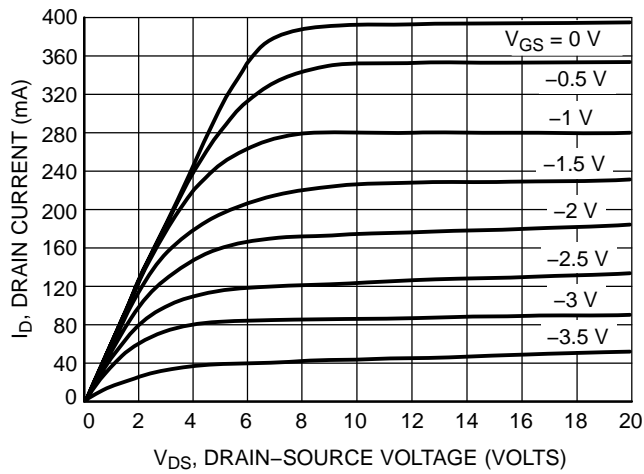
# J110



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



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

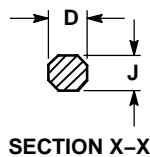
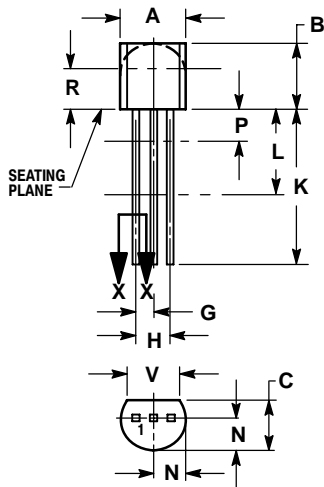


**Figure 7. Output Characteristic**  
 $V_{GS(off)} = -5.0\text{ V}$

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## 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
- SOURCE
- GATE

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