

# N-Channel RF Amplifier

## J211, MMBFJ211

### Description

This device is designed for HF/VHF mixer/amplifier and applications where process 50 is not adequate. Sufficient gain and low-noise for sensitive receivers. Sourced from process 90.

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Notes 1, 2)

Symbol	Parameter	Value	Unit
$V_{DG}$	Drain-Source Voltage	25	V
$V_{GS}$	Gate-Source Voltage	-25	V
$I_{GF}$	Forward Gate Current	10	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
- These are steady-state limits. onsemi should be consulted on applications involving pulsed or low-duty-cycle operations.

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

Symbol	Parameter	Max		Unit
		J211 (Note 3)	MMBFJ211 (Note 3)	
$P_D$	Total Device Dissipation	350	225	mW
	Derate Above $25^\circ\text{C}$	2.8	1.8	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	125	—	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	556	$^\circ\text{C}/\text{W}$

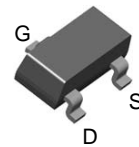
- Device mounted on FR-4 PCB 36 mm x 18 mm x 1.5 mm; mounting pad for the collector lead minimum 6  $\text{cm}^2$ .



1. Drain
2. Source
3. Gate

Bent Lead  
Tape & Reel  
Ammo Packing

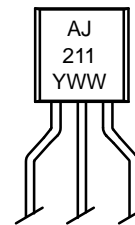
TO-92 3  
CASE 135AR



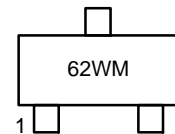
NOTE: Source & Drain are interchangeable

SOT-23  
CASE 318-08

### MARKING DIAGRAM



J211-D74Z



MMBFJ211

J211, 62W = Device Code  
A = Assembly Site  
WW = Work Week Number  
Y = Year of Production  
M = Date Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

# J211, MMBFJ211

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

Symbol	Parameter	Conditions	Min	Max	Unit
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### OFF CHARACTERISTICS

$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = 1.0 \mu\text{A}$ , $V_{DS} = 0$	-25	-	V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = 15 \text{ V}$ , $V_{DS} = 0$	-	-100	pA
$V_{GS(off)}$	Gate-Source Cut-Off Voltage	$V_{DS} = 15 \text{ V}$ , $I_D = 1.0 \text{ nA}$	-2.5	-4.5	V

### ON CHARACTERISTICS

$I_{DSS}$	Zero-Gate Voltage Drain Current (Note 4)	$V_{DS} = 15 \text{ V}$ , $V_{GS} = 0$	7.0	20	mA
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### SMALL SIGNAL CHARACTERISTICS

$g_{fs}$	Common Source Forward Transconductance	$V_{DS} = 15 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$	7000	12000	$\mu\text{mhos}$
$g_{oss}$	Common Source Output Conductance	$V_{DS} = 15 \text{ V}$ , $V_{GS} = 0$ , $f = 1.0 \text{ kHz}$	-	200	$\mu\text{mhos}$

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Pulse test: pulse width  $\leq 300 \mu\text{s}$

## TYPICAL PERFORMANCE CHARACTERISTICS

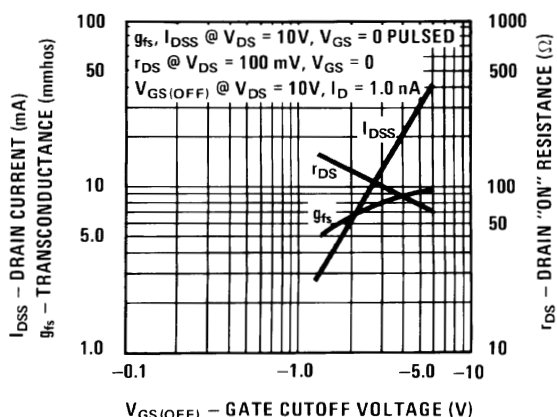


Figure 1. Parameter Interactions

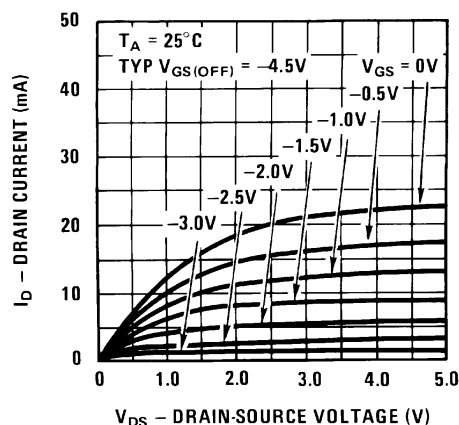


Figure 2. Common Drain-Source

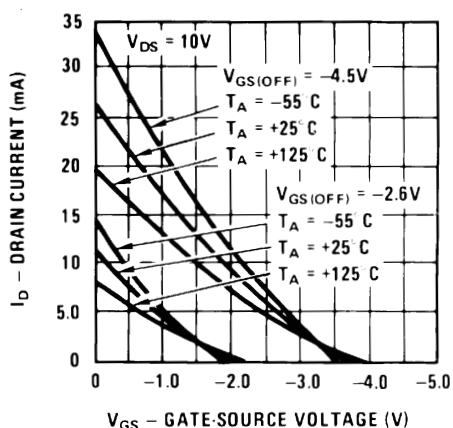


Figure 3. Transfer Characteristics

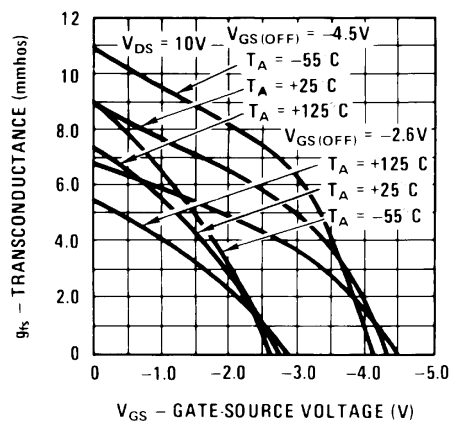


Figure 4. Transfer Characteristics

## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

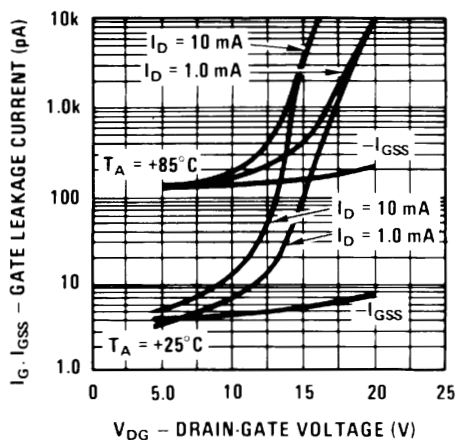


Figure 5. Leakage Current vs. Voltage

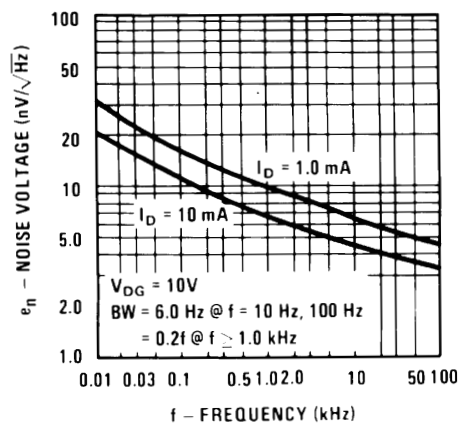


Figure 6. Noise Voltage vs. Frequency

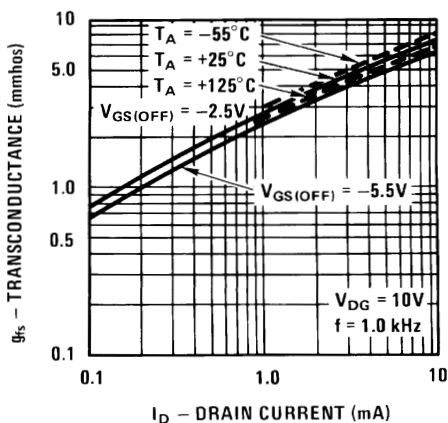


Figure 7. Transconductance vs. Drain Current

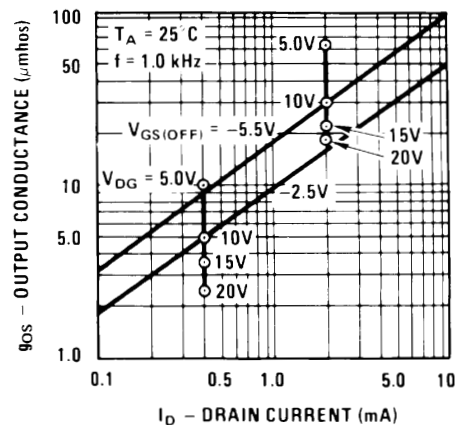


Figure 8. Output Conductance vs. Drain Current

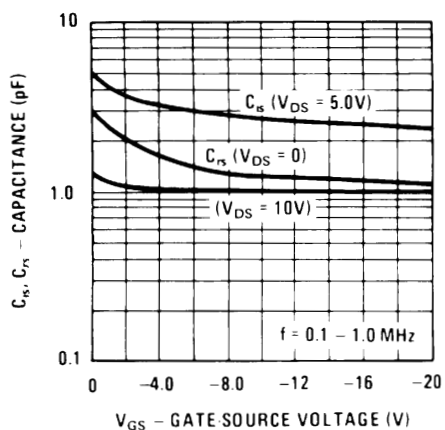


Figure 9. Capacitance vs. Voltage

## COMMON SOURCE CHARACTERISTICS

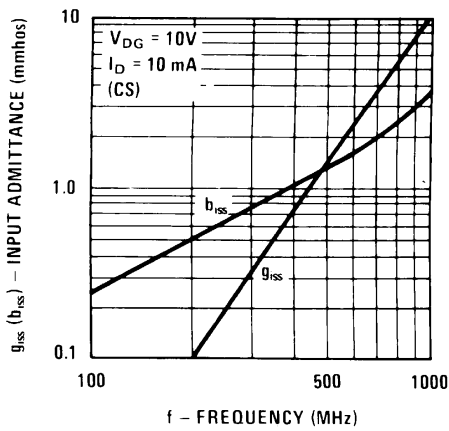


Figure 10. Input Admittance

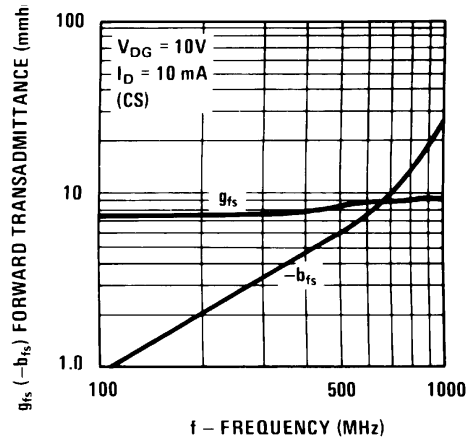


Figure 11. Forward Transadmittance

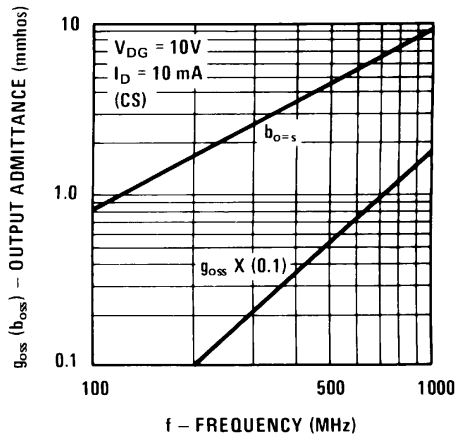


Figure 12. Output Admittance

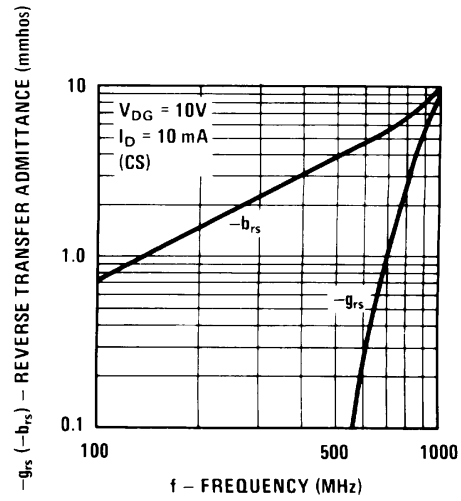


Figure 13. Reverse Transadmittance

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## COMMON GATE CHARACTERISTICS

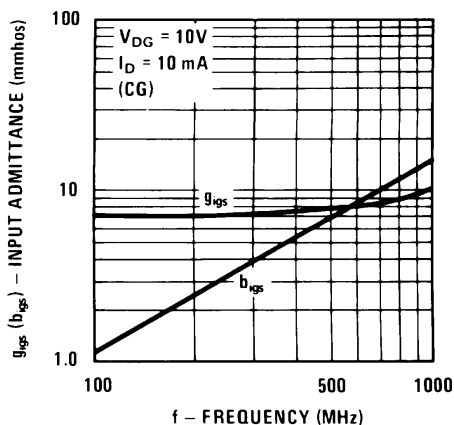


Figure 14. Input Admittance

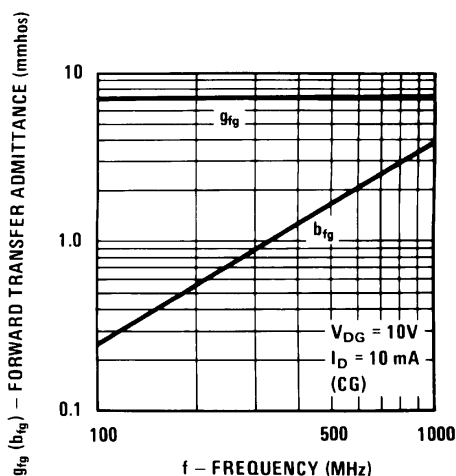


Figure 15. Forward Transadmittance

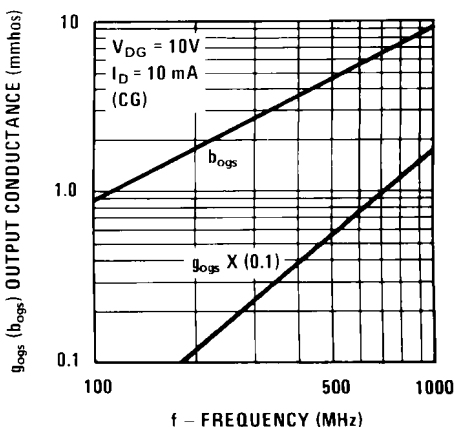


Figure 16. Output Admittance

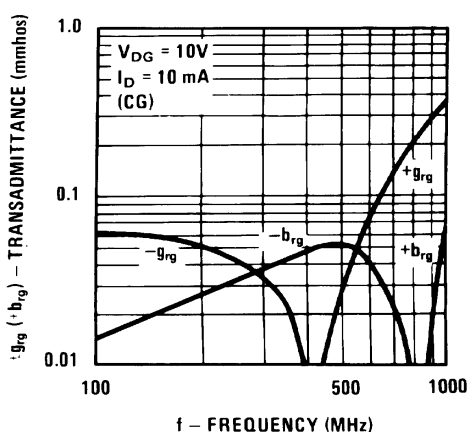


Figure 17. Reverse Transadmittance

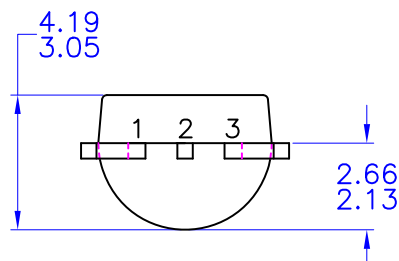
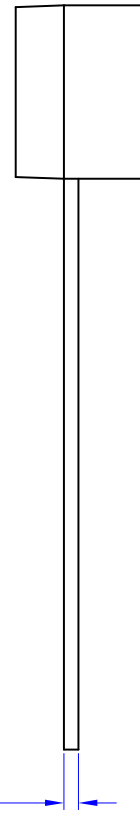
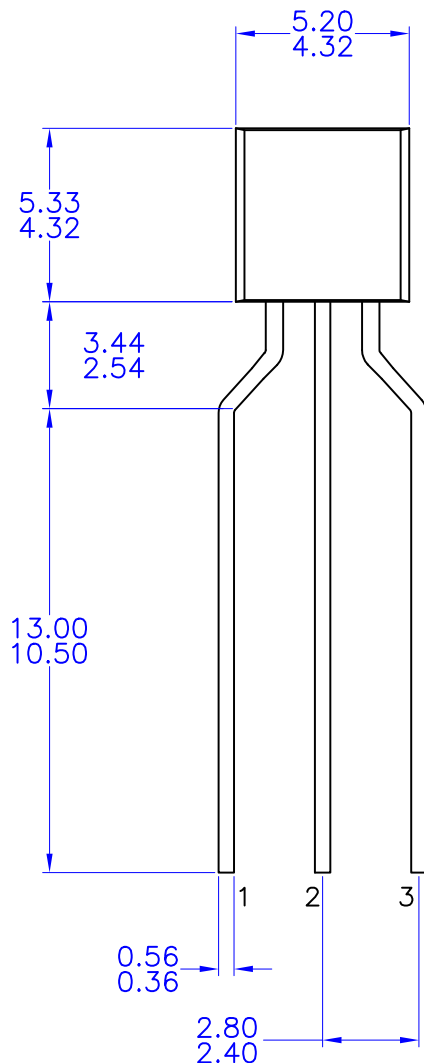
### ORDERING INFORMATION

Part Number	Top Mark	Package	Packing Method†
J211-D74Z	J211	TO-92 3L (Pb-Free)	Ammo
MMBFJ211	62W	SOT-23 3L (Pb-Free)	Tape and 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.

**TO-92 3 4.83x4.76 LEADFORMED**  
CASE 135AR  
ISSUE O

DATE 30 SEP 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994

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