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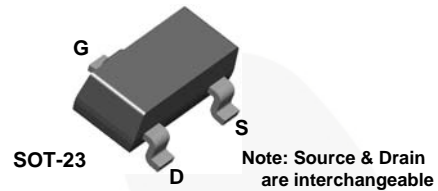


January 2015

# MMBFJ201 / MMBFJ202 N-Channel General-Purpose Amplifier

## Description

This device is designed primarily for low level audio and general-purpose applications with high impedance signal sources. Sourced from process 52.



## Ordering Information

Part Number	Top Mark	Package	Packing Method
MMBFJ201	62P	SOT-23 3L	Tape and Reel
MMBFJ202	62Q	SOT-23 3L	Tape and Reel

## Absolute Maximum Ratings<sup>(1), (2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{DG}$	Drain-Gate Voltage	40	V
$V_{GS}$	Gate-Source Voltage	-40	V
$I_{GF}$	Forward Gate Current	50	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Notes:

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

MMBFJ201 / MMBFJ202 — N-Channel General-Purpose Amplifier

**Thermal Characteristics<sup>(3)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Max.	Unit
$P_D$	Total Device Dissipation	350	mW
	Derate Above $25^\circ\text{C}$	2.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	$^\circ\text{C}/\text{W}$

**Note:**

3. Device mounted on FR-4 PCB 36mm × 18mm × 1.5mm; mounting pad for the collector lead minimum 6cm<sup>2</sup>.

**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = -1.0 \mu\text{A}$ , $V_{DS} = 0$	-40			V
$I_{GSS}$	Gate Reverse Current	$V_{GS} = -20 \text{ V}$ , $V_{DS} = 0$			-100	pA
$V_{GS(off)}$	Gate-Source Cut-Off Voltage	$V_{DS} = 20 \text{ V}$ , $I_D = 10 \text{ nA}$	MMBFJ201	-0.3	-1.5	V
			MMBFJ202	-0.8	-4.0	
<b>On Characteristics</b>						
$I_{DSS}$	Zero-Gate Voltage Drain Current <sup>(4)</sup>	$V_{DS} = 20 \text{ V}$ , $I_{GS} = 0$	MMBFJ201	0.2	1.0	mA
			MMBFJ202	0.9	4.5	
<b>Small Signal Characteristics</b>						
$y_{FS}$	Forward Transfer Admittance	$V_{DS} = 20 \text{ V}$ , $f = 1.0 \text{ kHz}$	MMBFJ201	500		$\mu\text{mhos}$
			MMBFJ202	1000		

**Note:**

4. Pulse test: pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2.0\%$

Typical Performance Characteristics

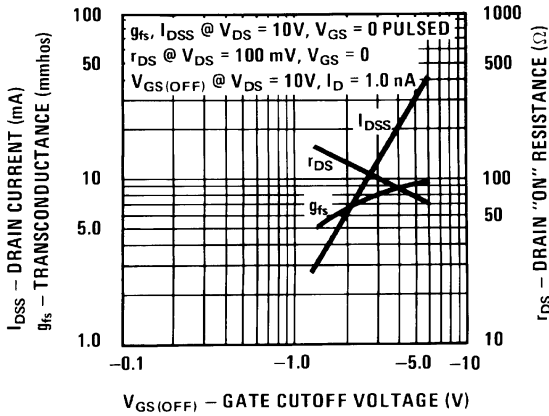


Figure 1. Parameter Interactions

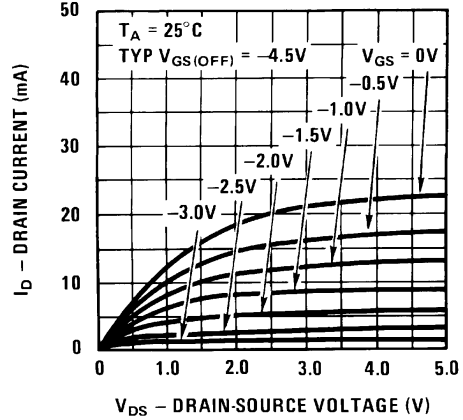


Figure 2. Common Drain-Source

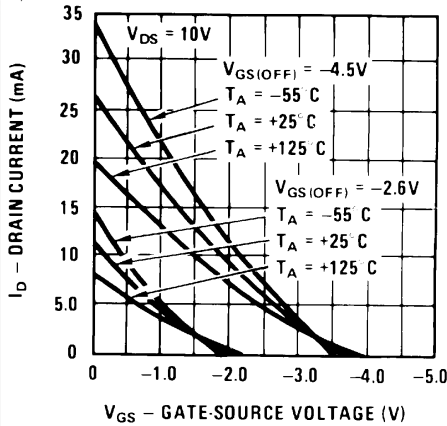


Figure 3. Transfer Characteristics

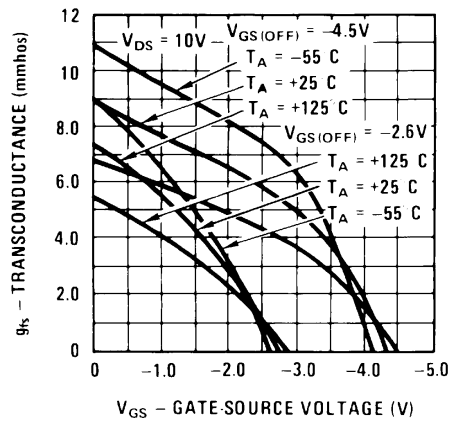


Figure 4. Transfer Characteristics

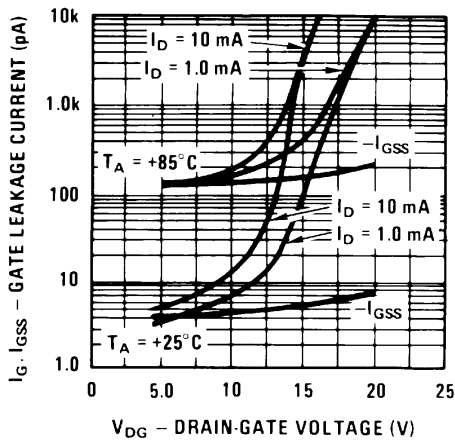


Figure 5. Leakage Current vs. Voltage

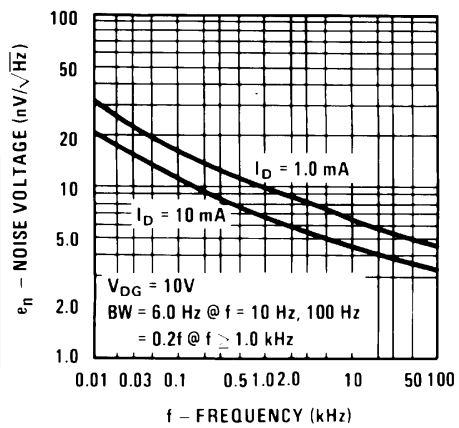


Figure 6. Noise Voltage vs. Frequency

Typical Performance Characteristics (Continued)

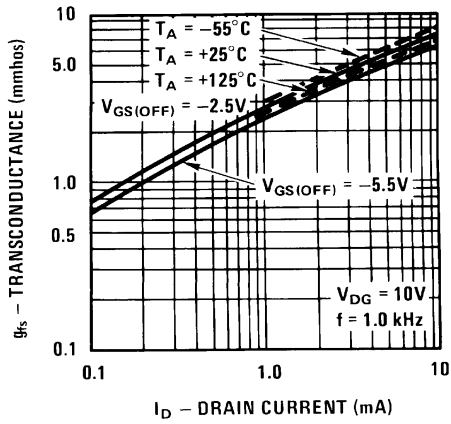


Figure 7. Transconductance vs. Drain Current

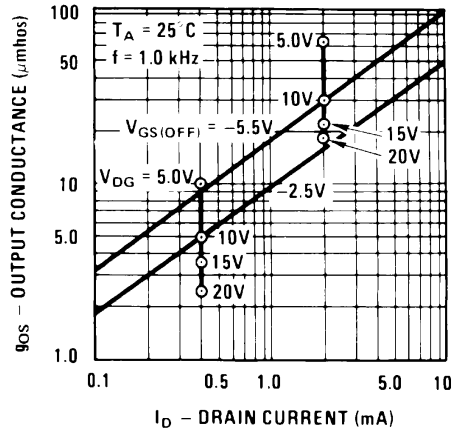


Figure 8. Output Conductance vs. Drain Current

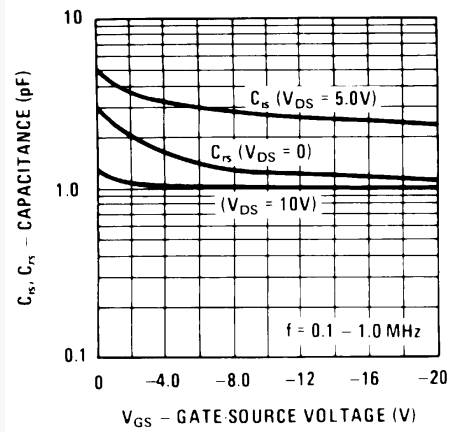


Figure 9. Capacitance vs. Voltage

Common Source Characteristics

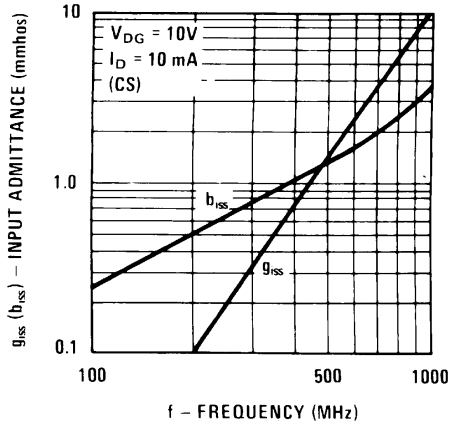


Figure 10. Input Admittance

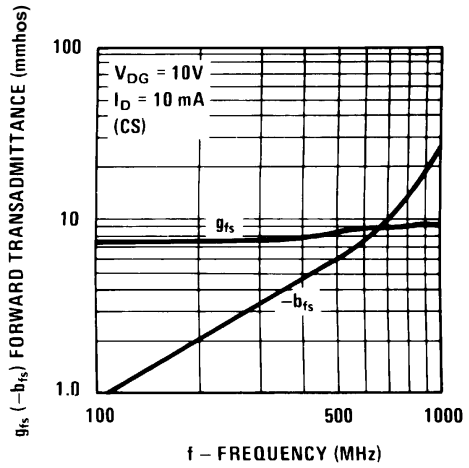


Figure 11. Forward Transadmittance

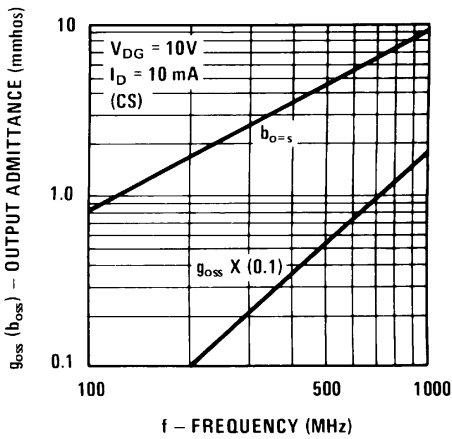


Figure 12. Output Admittance

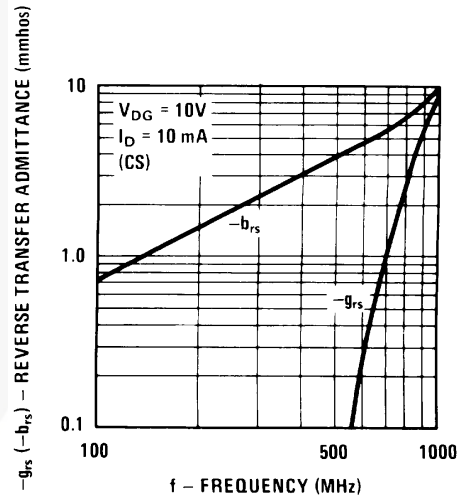


Figure 13. Reverse Transadmittance

### Common Gate Characteristics

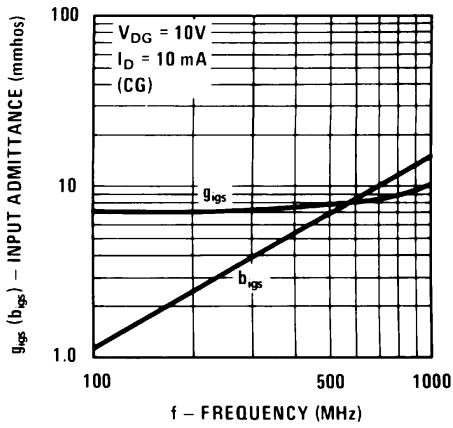


Figure 14. Input Admittance

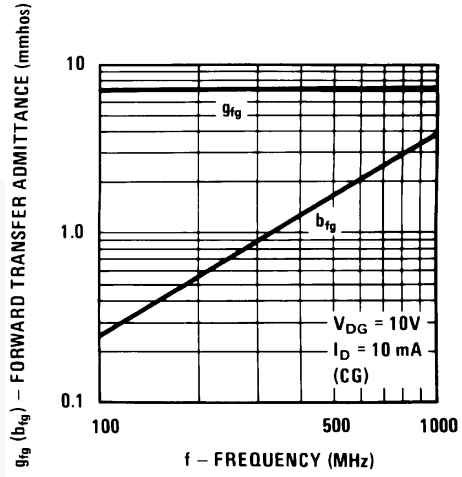


Figure 15. Forward Transadmittance

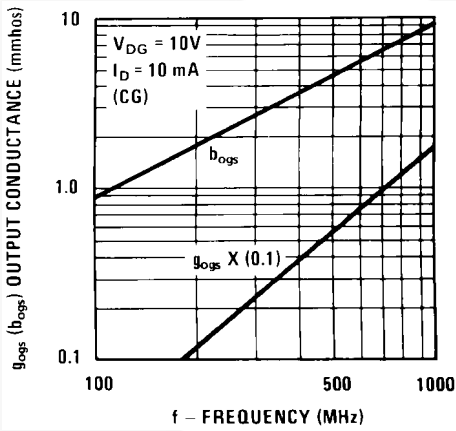


Figure 16. Output Admittance

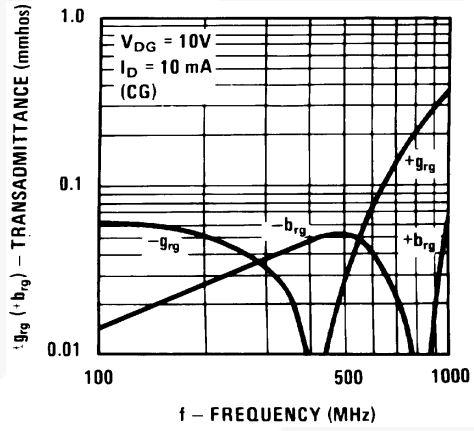
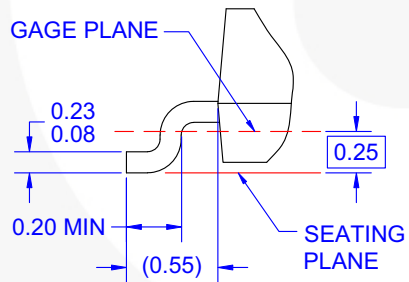
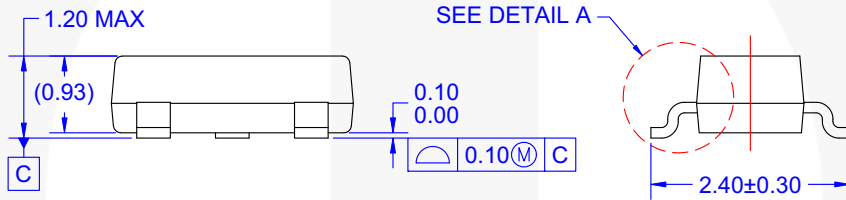
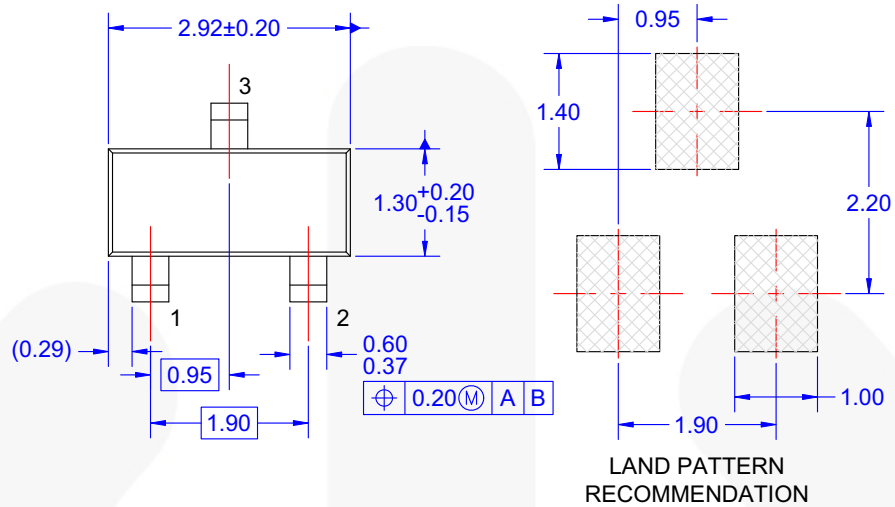


Figure 17. Reverse Transadmittance

Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 1994.
- E) DRAWING FILE NAME: MA03DREV10

**DETAIL A**  
SCALE: 2X


Figure 18. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE







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