

# N-Channel General-Purpose Amplifier

## MMBFJ201, MMBFJ202

### Description

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

### Applications

- These are Pb-Free Devices

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

Symbol	Parameter	Value	Unit
$V_{DG}$	Drain-Source 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	$^\circ\text{C}$

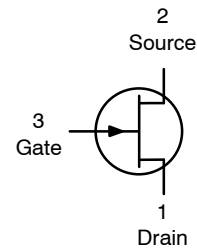
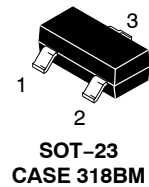
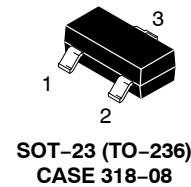
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- 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.

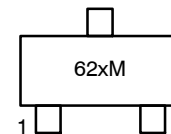
### THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 3)

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	$^\circ\text{C}/\text{W}$

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



### MARKING DIAGRAM



62x = Specific Device Code  
 x = P or Q  
 M = Date Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

# MMBFJ201, MMBFJ202

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Max	Unit
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### OFF CHARACTERISTICS

V <sub>(BR)GSS</sub>	Gate-Source Breakdown Voltage	I <sub>G</sub> = -1.0 μA, V <sub>DS</sub> = 0		-40	-	V
I <sub>GSS</sub>	Gate Reverse Current	V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0		-	-100	pA
V <sub>GS(off)</sub>	Gate-Source Cut-Off Voltage	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 10 nA	MMBFJ201	-0.3	-1.5	V
			MMBFJ202	-0.8	-4.0	

### ON CHARACTERISTICS

I <sub>DSS</sub>	Zero-Gate Voltage Drain Current (Note 4)	V <sub>DS</sub> = 20 V, I <sub>GS</sub> = 0	MMBFJ201	0.2	1.0	mA
			MMBFJ202	0.9	4.5	

### SMALL SIGNAL CHARACTERISTICS

y <sub>FS</sub>	Forward Transfer Admittance	V <sub>DS</sub> = 20 V, f = 1.0 kHz	MMBFJ201	500		μmhos
			MMBFJ202	1000		

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 ≤ 300 μs, duty cycle ≤ 2%.

TYPICAL PERFORMANCE CHARACTERISTICS

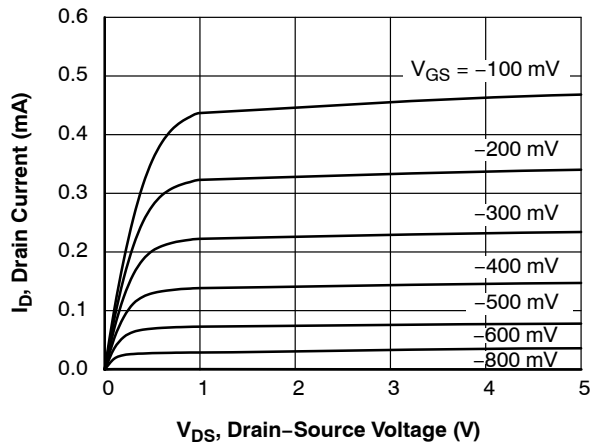


Figure 1. Common Drain-Source (MMBFJ201)

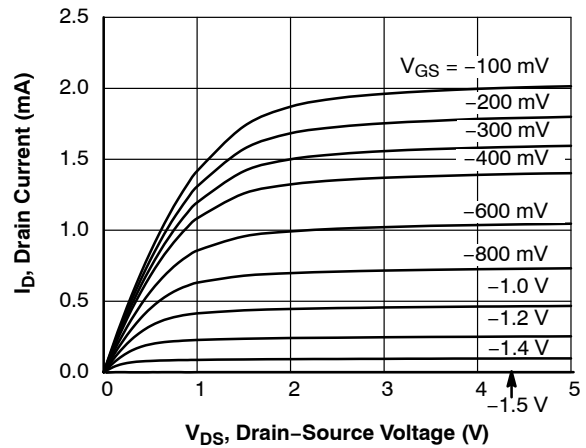


Figure 2. Common Drain-Source (MMBFJ202)

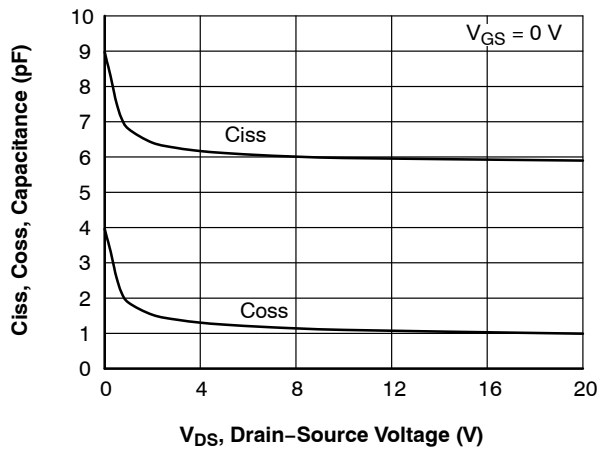


Figure 3. Capacitance vs. Voltage (MMBFJ201)

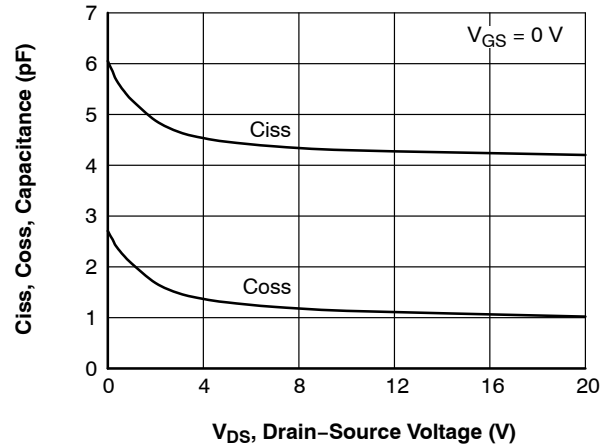


Figure 4. Capacitance vs. Voltage (MMBFJ202)

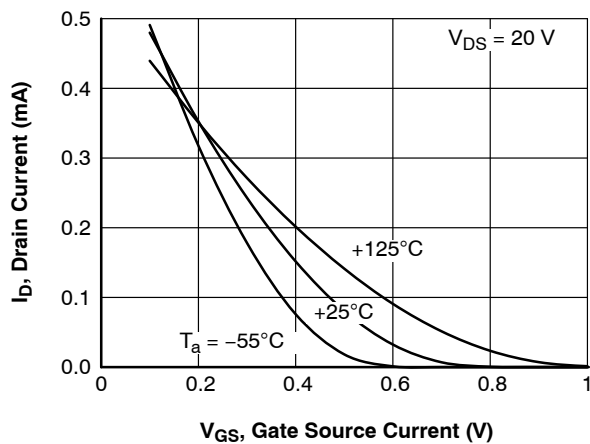


Figure 5. Transfer Characteristics (MMBFJ201)

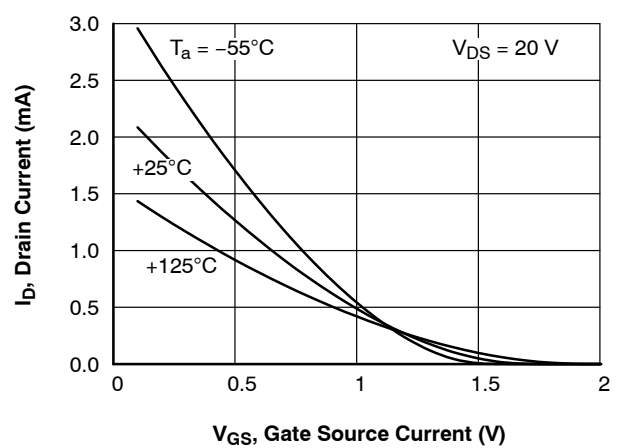


Figure 6. Transfer Characteristics (MMBFJ202)

# MMBFJ201, MMBFJ202

## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

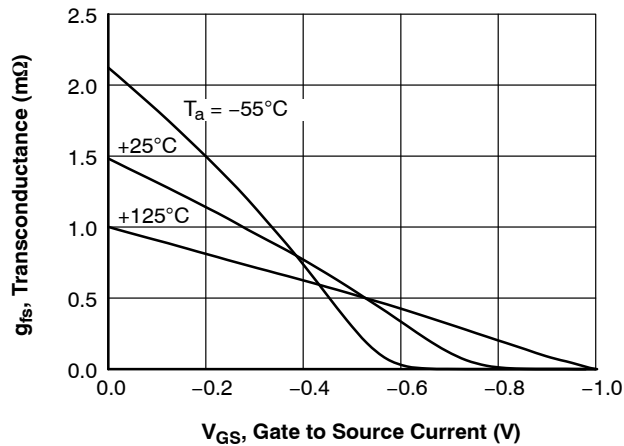


Figure 7. Transfer Characteristics (MMBFJ201)

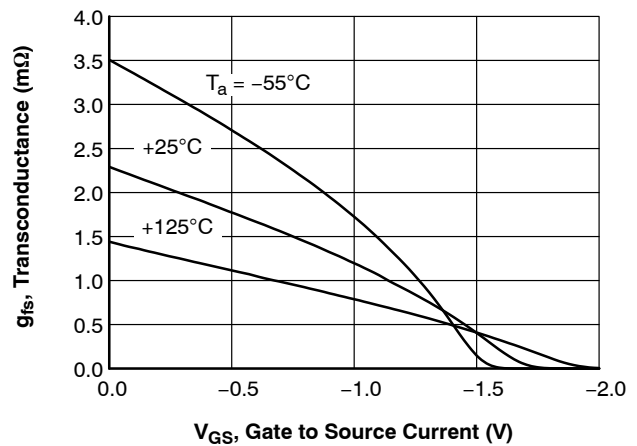


Figure 8. Transfer Characteristics (MMBFJ202)

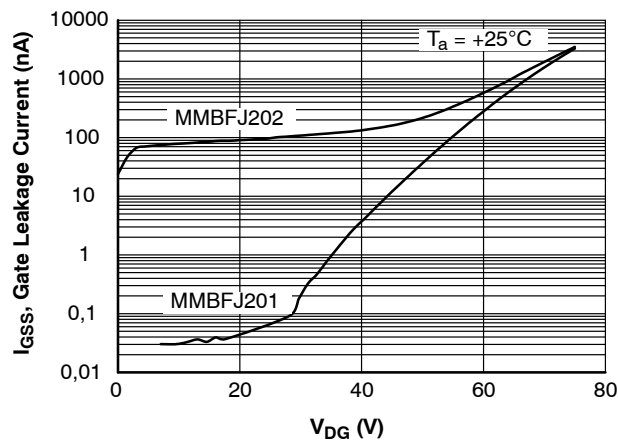


Figure 9. Leakage Current vs. Voltage

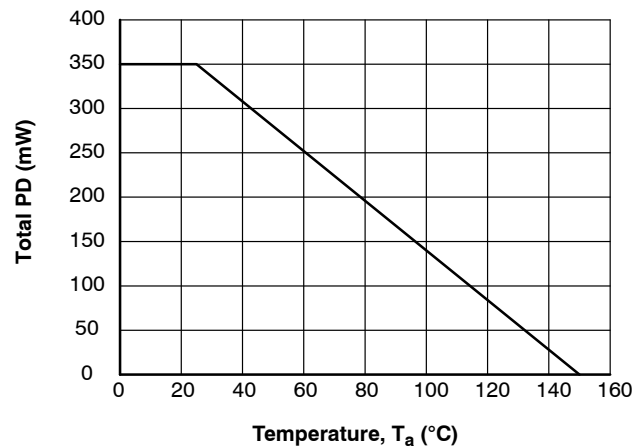


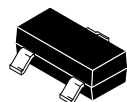
Figure 10. Total PD vs. Temperature

## ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping <sup>†</sup>
MMBFJ201	62P	SOT-23 (Pb-Free)	3000 / Tape & Reel
MMBFJ202	62Q	SOT-23 (TO-236) (Pb-Free)	3000 / 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](#).

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



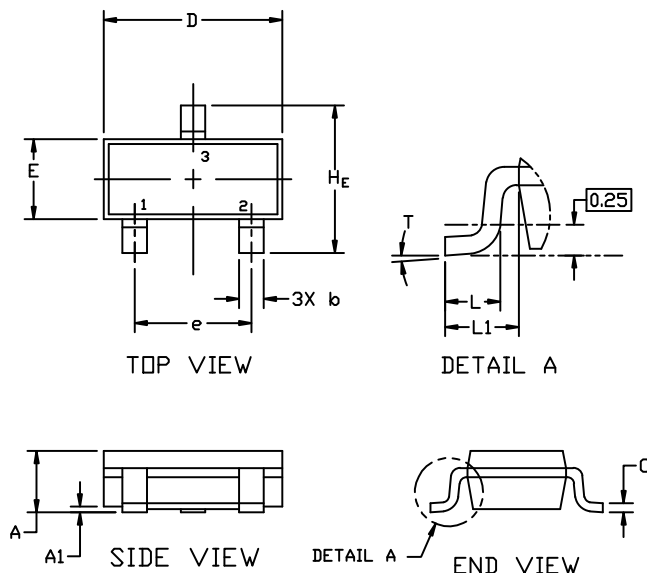
SCALE 4:1

## SOT-23 (TO-236)

CASE 318

ISSUE AT

DATE 01 MAR 2023

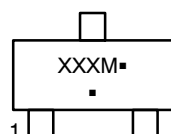


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

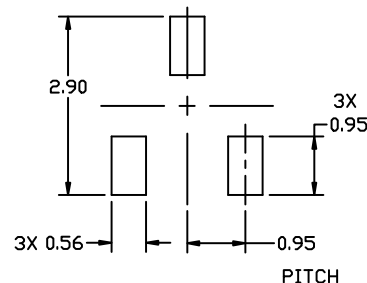
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H <sub>E</sub>	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	---	10°	0°	---	10°

### GENERIC MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



### RECOMMENDED MOUNTING FOOTPRINT

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

## STYLES ON PAGE 2

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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS



### SOT-23 (TO-236) CASE 318 ISSUE AT

DATE 01 MAR 2023

STYLE 1 THRU 5: CANCELLED	STYLE 6: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 7: PIN 1. EMITTER 2. BASE 3. COLLECTOR	STYLE 8: PIN 1. ANODE 2. NO CONNECTION 3. CATHODE		
STYLE 9: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 10: PIN 1. DRAIN 2. SOURCE 3. GATE	STYLE 11: PIN 1. ANODE 2. CATHODE 3. CATHODE-ANODE	STYLE 12: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 13: PIN 1. SOURCE 2. DRAIN 3. GATE	STYLE 14: PIN 1. CATHODE 2. GATE 3. ANODE
STYLE 15: PIN 1. GATE 2. CATHODE 3. ANODE	STYLE 16: PIN 1. ANODE 2. CATHODE 3. CATHODE	STYLE 17: PIN 1. NO CONNECTION 2. ANODE 3. CATHODE	STYLE 18: PIN 1. NO CONNECTION 2. CATHODE 3. ANODE	STYLE 19: PIN 1. CATHODE 2. ANODE 3. CATHODE-ANODE	STYLE 20: PIN 1. CATHODE 2. ANODE 3. GATE
STYLE 21: PIN 1. GATE 2. SOURCE 3. DRAIN	STYLE 22: PIN 1. RETURN 2. OUTPUT 3. INPUT	STYLE 23: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 24: PIN 1. GATE 2. DRAIN 3. SOURCE	STYLE 25: PIN 1. ANODE 2. CATHODE 3. GATE	STYLE 26: PIN 1. CATHODE 2. ANODE 3. NO CONNECTION
STYLE 27: PIN 1. CATHODE 2. CATHODE 3. CATHODE	STYLE 28: PIN 1. ANODE 2. ANODE 3. ANODE				

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