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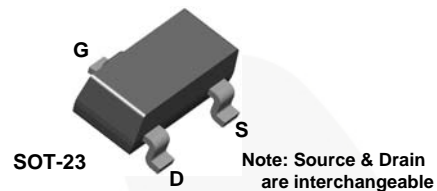


January 2015

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^{(1), (2)}

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°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics⁽³⁾

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°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 6cm².

Electrical Characteristics

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|---|----------|------|------|------------------|
| Off Characteristics | | | | | | |
| $V_{(BR)GSS}$ | 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 | |
| On Characteristics | | | | | | |
| I_{DSS} | Zero-Gate Voltage Drain Current ⁽⁴⁾ | $V_{DS} = 20 \text{ V}$, $I_{GS} = 0$ | MMBFJ201 | 0.2 | 1.0 | mA |
| | | | MMBFJ202 | 0.9 | 4.5 | |
| Small Signal Characteristics | | | | | | |
| y_{FS} | Forward Transfer Admittance | $V_{DS} = 20 \text{ V}$, $f = 1.0 \text{ kHz}$ | MMBFJ201 | 500 | | μmhos |
| | | | MMBFJ202 | 1000 | | |

Note:

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

Typical Performance Characteristics

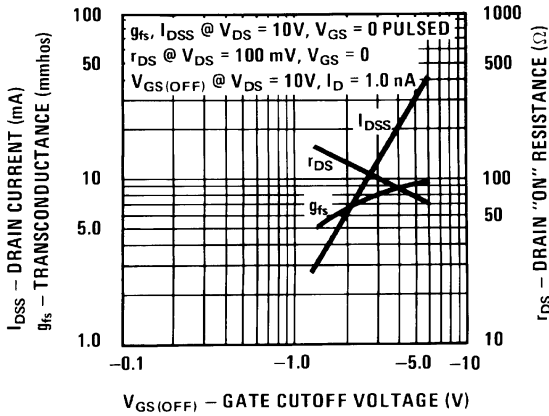


Figure 1. Parameter Interactions

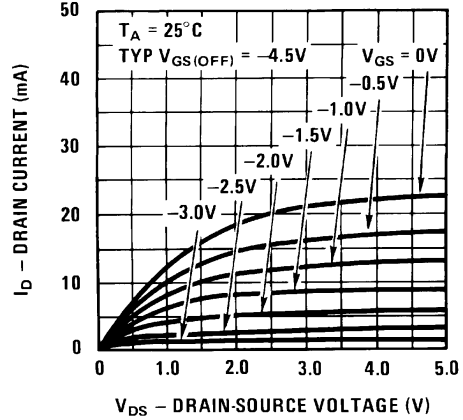


Figure 2. Common Drain-Source

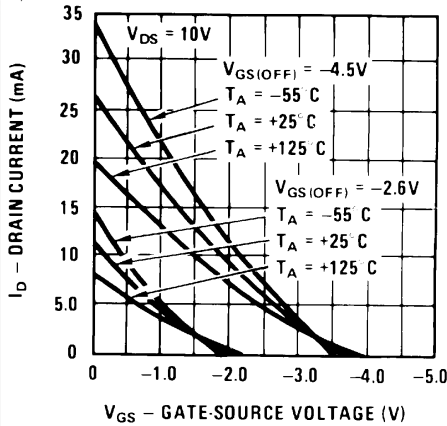


Figure 3. Transfer Characteristics

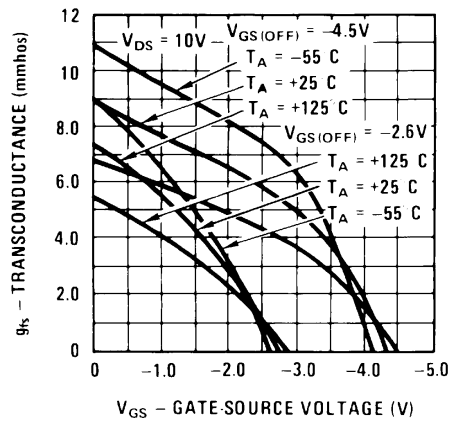


Figure 4. Transfer Characteristics

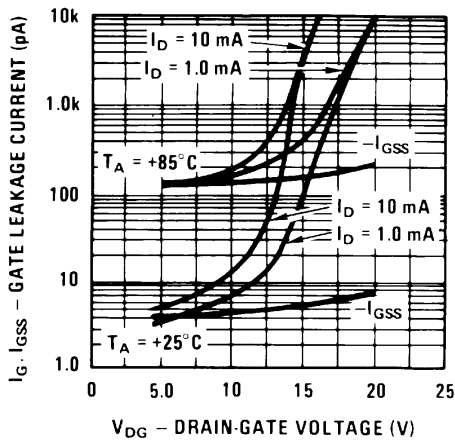


Figure 5. Leakage Current vs. Voltage

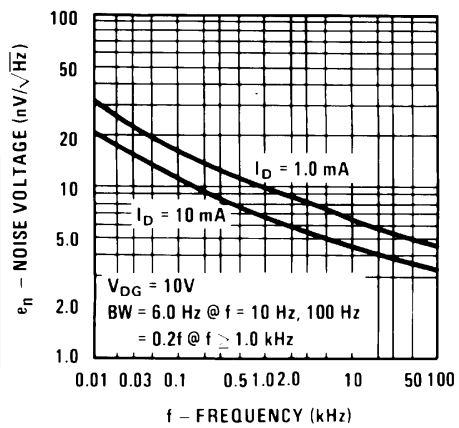


Figure 6. Noise Voltage vs. Frequency

Typical Performance Characteristics (Continued)

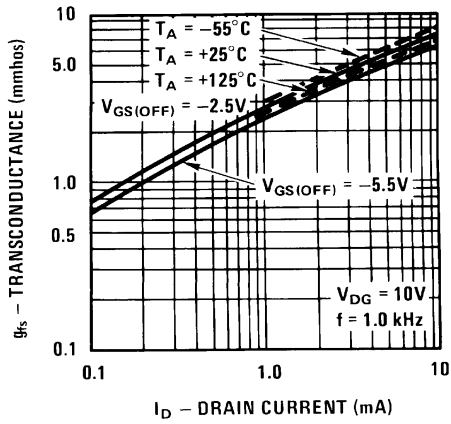


Figure 7. Transconductance vs. Drain Current

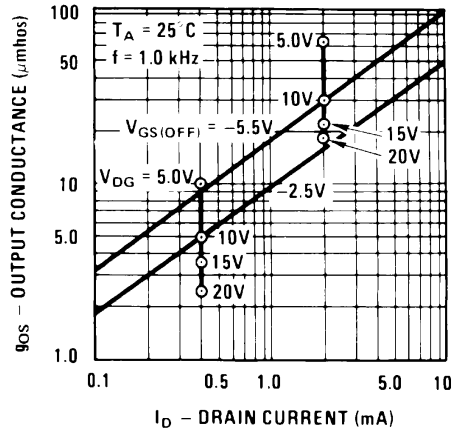


Figure 8. Output Conductance vs. Drain Current

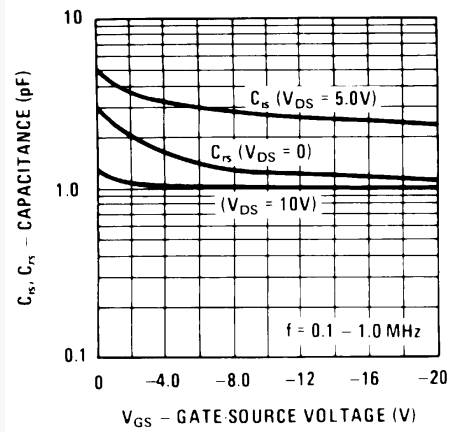


Figure 9. Capacitance vs. Voltage

Common Source Characteristics

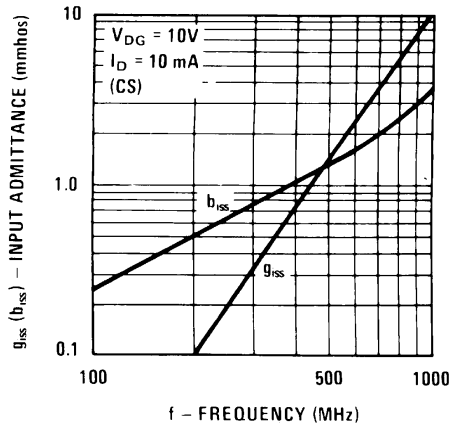


Figure 10. Input Admittance

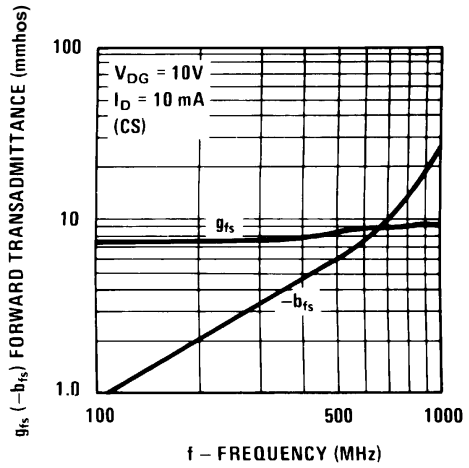


Figure 11. Forward Transadmittance

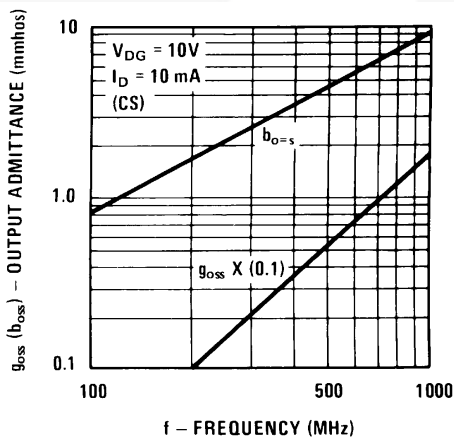


Figure 12. Output Admittance

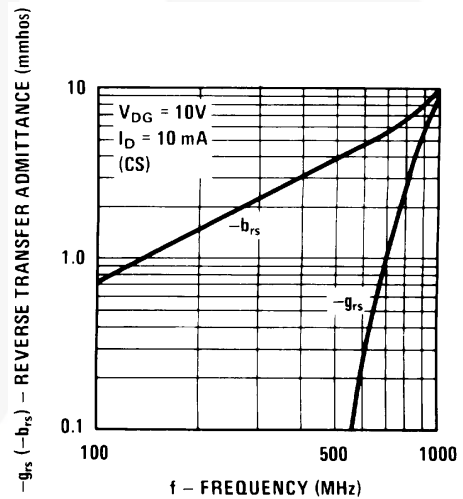


Figure 13. Reverse Transadmittance

Common Gate Characteristics

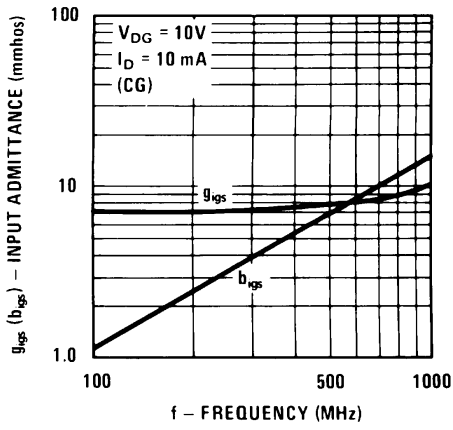


Figure 14. Input Admittance

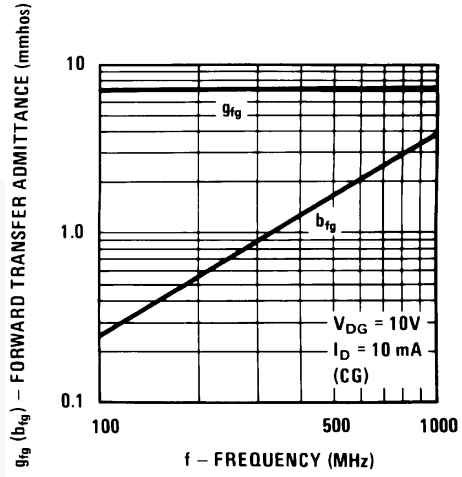


Figure 15. Forward Transadmittance

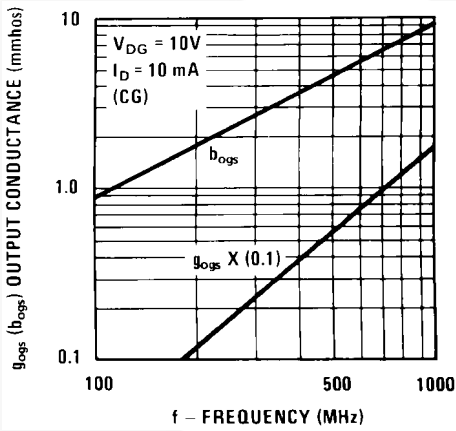


Figure 16. Output Admittance

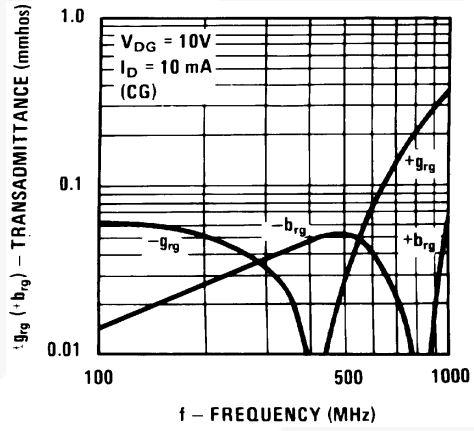
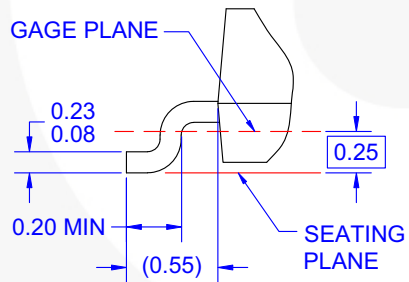
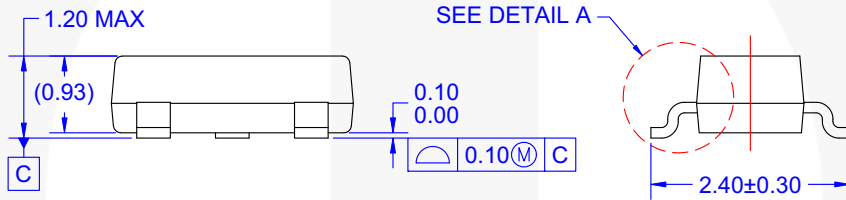
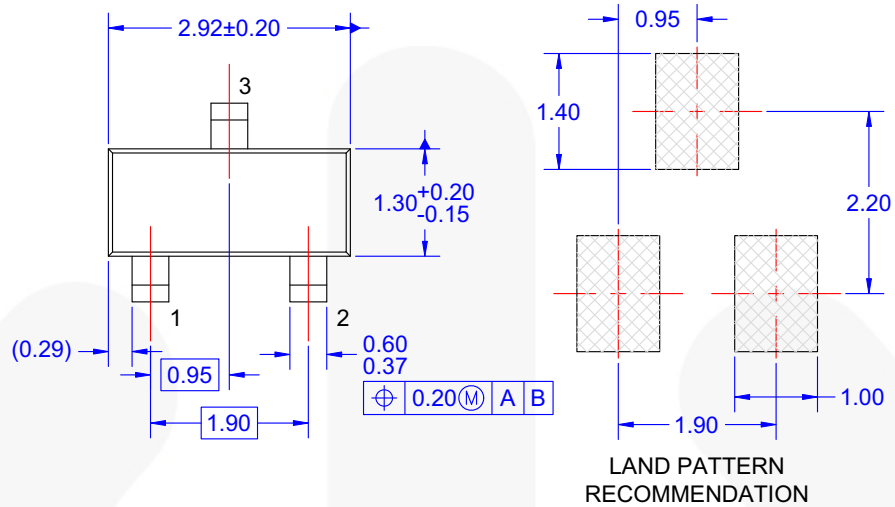


Figure 17. Reverse Transadmittance

Physical Dimensions



- NOTES: UNLESS OTHERWISE SPECIFIED
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 - 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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Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.