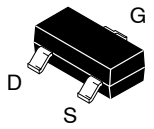
# N-Channel RF Amplifier

# MMBF5484, MMBF5485, MMBF5486

This device is designed primarily for electronic switching applications such as low On Resistance analog switching. Sourced from Process 50.




NOTE: Source & Drain are interchangeable

**SOT−23**
**CASE 318−08**

## ABSOLUTE MAXIMUM RATINGS* ($T_A$ = 25°C unless otherwise noted)

| Symbol | Rating | Value | Unit |
|---|---|---|---|
| $V_{DG}$ | Drain−Gate 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 | °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 rating are limiting values above which the serviceability of any semiconductor device may be impaired.

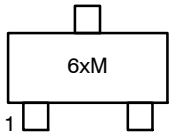
1. These rating are based on a maximum junction temperature of 150°C.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## THERMAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted)

| Symbol | Characteristic | Max *MMBF5484−5486 | Unit |
|---|---|---|---|
| $P_D$ | Total Device Dissipation<br>Derate above 25°C | 225<br>1.8 | mW<br>mW/°C |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | − | °C/W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 556 | °C/W |

*Device mounted on FR−4 PCB 1.6” x 1.6” x 0.06”.

## MARKING DIAGRAM




6x = Device Code (x = B, M, H)
M = Date Code

## ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MMBF5484 | SOT−23 (Pb−Free) | 3000 Tape & Reel |
| MMBF5484 | | |
| MMBF5484 | | |

†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.

**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25°C unless otherwise noted)

| Symbol | Parameter | Test Condition | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | | |
| $V_{(BR)GSS}$ | Gate−Source Breakdown Voltage | $I_G$ = −1.0 μA, $V_{DS}$ = 0 | | −25 | – | – | V |
| $I_{GSS}$ | Gate Reverse Current | $V_{GS}$ = −20 V, $V_{DS}$ = 0<br>$V_{GS}$ = −20 V, $V_{DS}$ = 0, $T_A$ = 100°C | | –<br>– | –<br>– | −1.0<br>−0.2 | nA<br>μA |
| $V_{GS(off)}$ | Gate−Source Cutoff Voltage | $V_{DS}$ = 15 V, $I_D$ = 10 nA | *5484*<br>*5485*<br>*5486* | −0.3<br>−0.5<br>−2.0 | –<br>–<br>– | −3.0<br>−4.0<br>−6.0 | V<br>V<br>V |
| **ON CHARACTERISTICS** | | | | | | | |
| $I_{DSS}$ | Zero−Gate Voltage Drain Current* | $V_{DS}$ = 15 V, $V_{GS}$ = 0 | *5484*<br>*5485*<br>*5486* | 1.0<br>4.0<br>8.0 | –<br>–<br>– | 5.0<br>10<br>20 | mA<br>mA<br>mA |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | | | |
| $g_{fs}$ | Forward Transfer Conductance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 1.0 kHz | *5484*<br>*5485*<br>*5486* | 3000<br>3500<br>4000 | –<br>–<br>– | 6000<br>7000<br>8000 | μmhos<br>μmhos<br>μmhos |
| $Re(y_{is})$ | Input Conductance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 100 MHz | *5484* | – | – | 100 | μmhos |
| | | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 400 kHz | *5485 / 5486* | – | – | 1000 | μmhos |
| $g_{os}$ | Output Conductance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 1.0 kHz | *5484*<br>*5485*<br>*5486* | –<br>–<br>– | –<br>–<br>– | 50<br>60<br>75 | μmhos<br>μmhos<br>μmhos |
| $Re(y_{os})$ | Output Conductance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 100 MHz | *5484* | – | – | 75 | μmhos |
| | | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 400 MHz | *5485 / 5486* | – | – | 100 | μmhos |
| $Re(y_{fs})$ | Forward Transconductance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 100 MHz | *5484* | 2500 | – | – | μmhos |
| | | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 400 MHz | *5485*<br>*5486* | 3000<br>3500 | –<br>– | –<br>– | μmhos<br>μmhos |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 1.0 MHz | | – | – | 5.0 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 1.0 MHz | | – | – | 1.0 | pF |
| $C_{oss}$ | Output Capacitance | $V_{DS}$ = 15 V, $V_{GS}$ = 0, f = 1.0 MHz | | – | – | 2.0 | pF |
| NF | Noise Figure | $V_{DS}$ = 15 V, $R_G$ = 1.0 kΩ, f = 100 MHz | *5484* | – | – | 3.0 | dB |
| | | $V_{DS}$ = 15 V, $R_G$ = 1.0 kΩ, f = 400 MHz | *5484* | – | 4.0 | – | dB |
| | | $V_{DS}$ = 15 V, $R_G$ = 1.0 kΩ, f = 100 MHz | *5485 / 5486* | – | – | 2.0 | dB |
| | | $V_{DS}$ = 15 V, $R_G$ = 1.0 kΩ, f = 400 MHz | *5485 / 5486* | – | – | 4.0 | dB |

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.

## TYPICAL CHARACTERISTICS

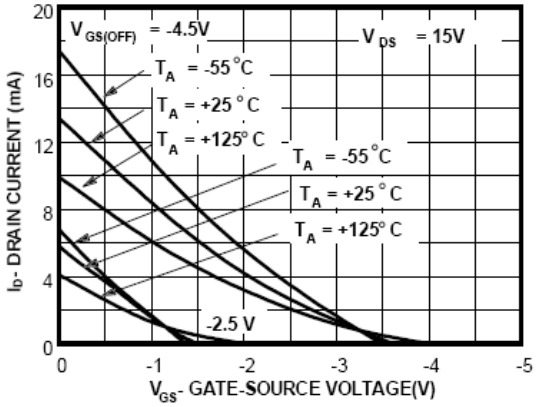



**Figure 1. Transfer Characteristics**

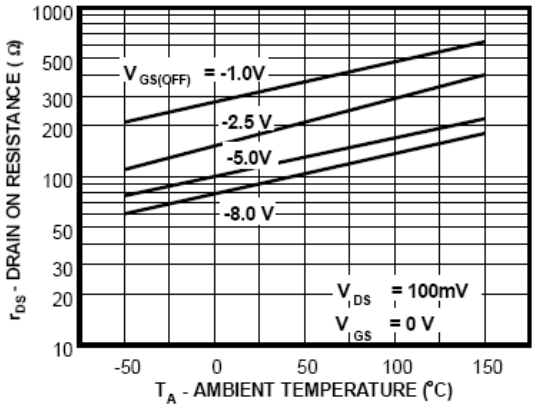



**Figure 2. Channel Resistance vs. Temperature**

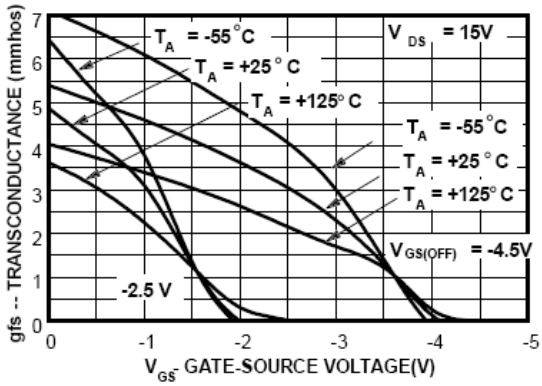



**Figure 3. Transconductance Characteristics**

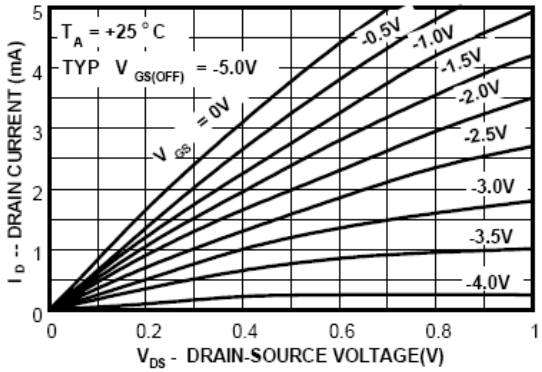



**Figure 4. Common Drain−Source Characteristics**

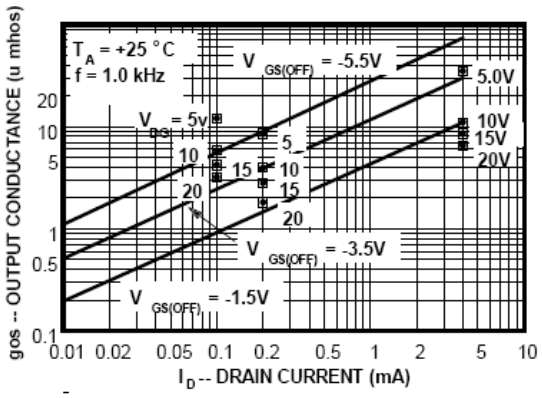



**Figure 5. Output Conductance vs. Drain Current**

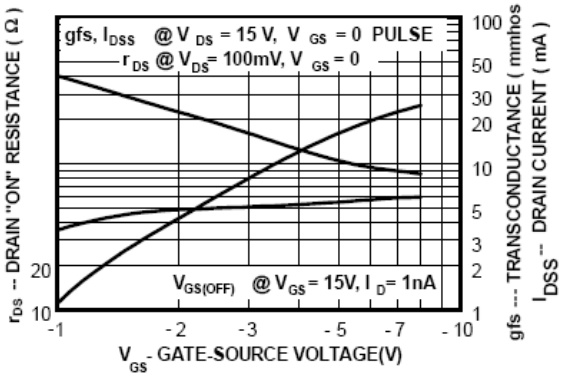



**Figure 6. Transconductance Parameter Interactions**

## TYPICAL CHARACTERISTICS (continued)

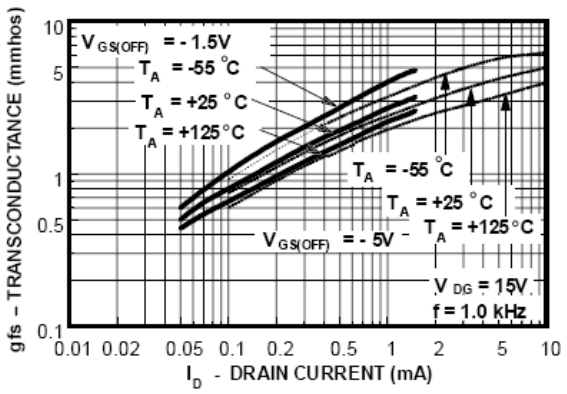



Figure 7. Transconductance vs. Drain Current

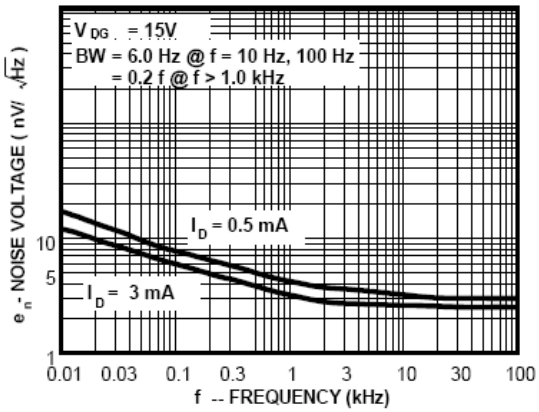



Figure 8. Noise Voltage vs. Frequency

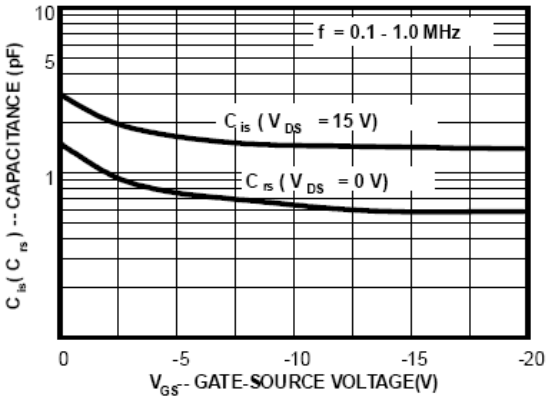



Figure 9. Capacitance vs. Voltage

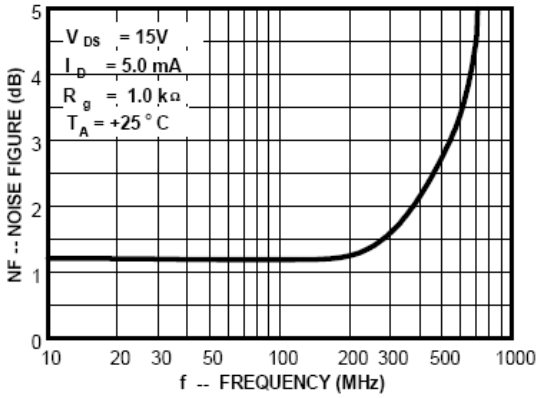



Figure 10. Noise Figure Frequency

## COMMON SOURCE CHARACTERISTICS

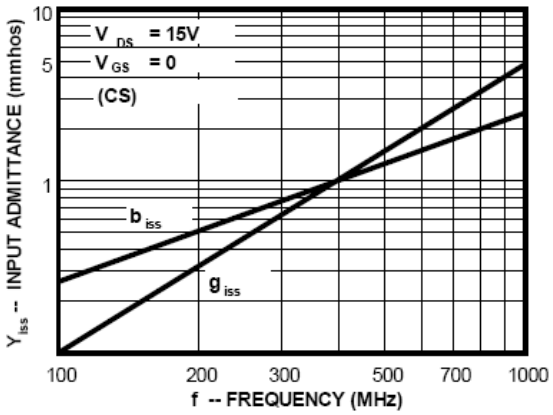



Figure 11. Input Admittance

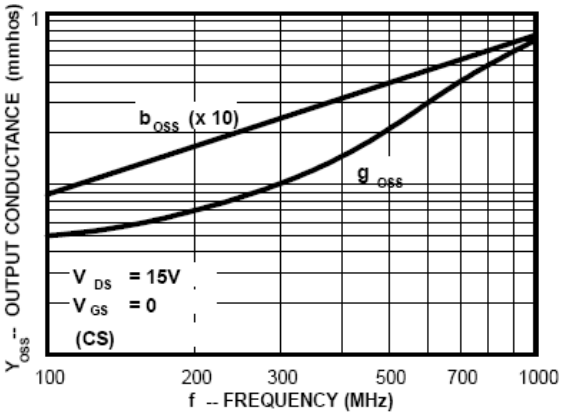



Figure 12. Output Admittance

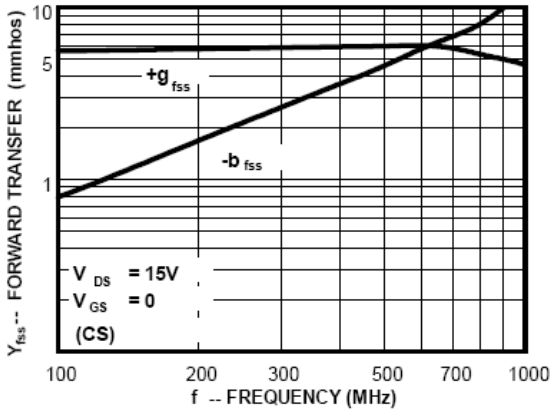



Figure 13. Forward Transadmittance

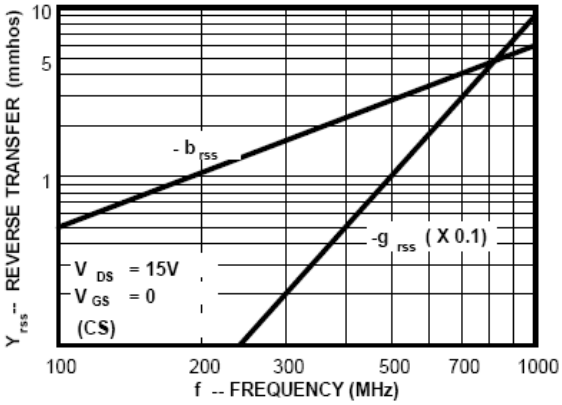



Figure 14. Reverse Transadmittance

## COMMON GATE CHARACTERISTICS

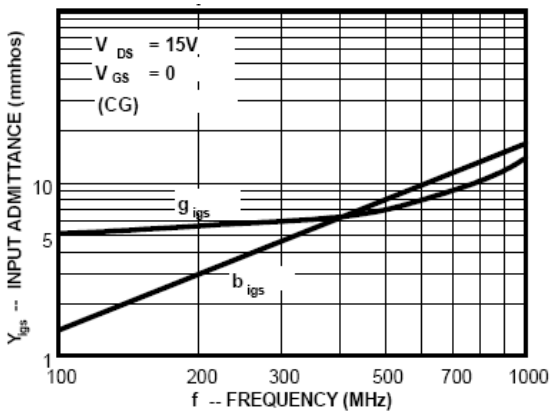



Figure 15. Input Admittance

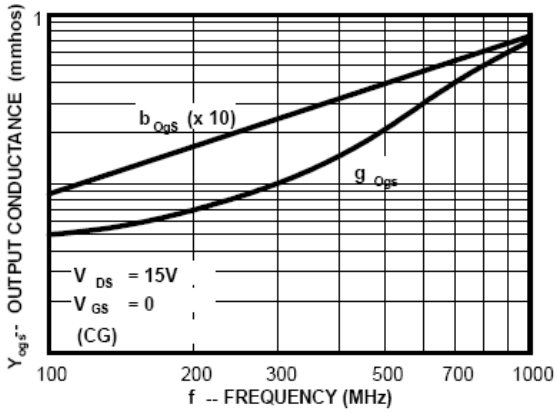



Figure 16. Output Admittance

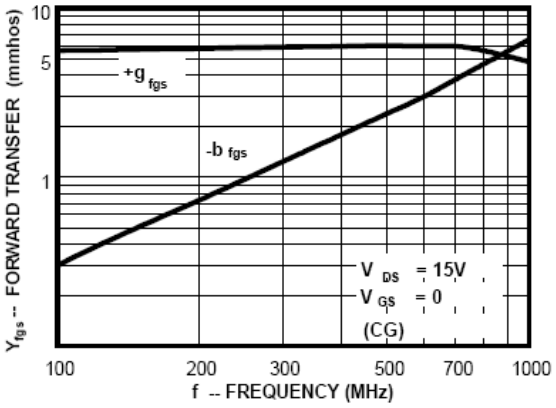



Figure 17. Forward Transadmittance

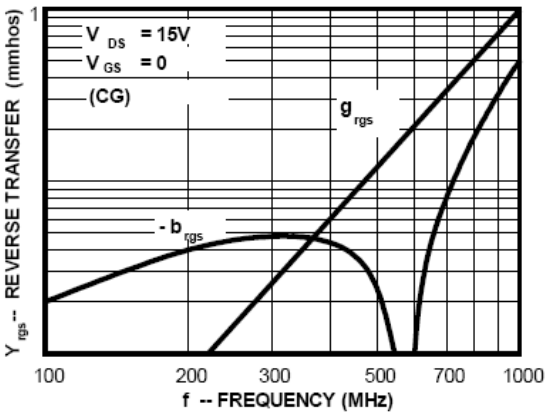



Figure 18. Reverse Transadmittance

## ADDITIONAL INFORMATION

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