



BF1207

Dual N-channel dual gate MOSFET

Rev. 2 — 7 September 2011

Product data sheet

1. Product profile

1.1 General description

The BF1207 is a combination of two dual gate MOSFET amplifiers with shared source and gate2 leads and an integrated switch.

The source and substrate are interconnected. Internal bias circuits enable Direct Current (DC) stabilization and a very good cross-modulation performance during Automatic Gain Control (AGC). Integrated diodes between the gates and source protect against excessive input voltage surges. The BF1207 has a SOT363 micro-miniature plastic package.

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

1.2 Features and benefits

- Two low noise gain controlled amplifiers in a single package. One with a fully integrated bias and one with partly integrated bias
- Internal switch to save external components
- Superior cross-modulation performance during AGC
- High forward transfer admittance
- High forward transfer admittance to input capacitance ratio

1.3 Applications

- Gain controlled low noise amplifiers for Very High Frequency (VHF) and Ultra High Frequency (UHF) applications with 5 V supply voltage, such as digital and analog television tuners and professional communication equipment



1.4 Quick reference data

Table 1. Quick reference data
Per MOSFET unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|------------------------------|---|-----|-----|-----|------------------|
| V_{DS} | drain-source voltage | DC | - | - | 6 | V |
| I_D | drain current | DC | - | - | 30 | mA |
| P_{tot} | total power dissipation | $T_{sp} \leq 107\text{ }^\circ\text{C}$ | [1] | - | 180 | mW |
| $ y_{fs} $ | forward transfer admittance | $f = 1\text{ MHz}$ | | | | |
| | | amplifier A; $I_D = 18\text{ mA}$ | 25 | 30 | 40 | mS |
| | | amplifier B; $I_D = 14\text{ mA}$ | 26 | 31 | 41 | mS |
| $C_{iss(G1)}$ | input capacitance at gate1 | $f = 100\text{ MHz}$ | | | | |
| | | amplifier A | - | 2.2 | 2.7 | pF |
| | | amplifier B | - | 1.9 | 2.4 | pF |
| C_{rss} | reverse transfer capacitance | $f = 100\text{ MHz}$ | - | 20 | - | fF |
| NF | noise figure | amplifier A; $f = 400\text{ MHz}$ | - | 1.3 | - | dB |
| | | amplifier B; $f = 800\text{ MHz}$ | - | 1.4 | - | dB |
| Xmod | cross-modulation | input level for $k = 1\%$ at 40 dB AGC | | | | |
| | | amplifier A | 100 | 105 | - | dB μ V |
| | | amplifier B | 100 | 103 | - | dB μ V |
| T_j | junction temperature | | - | - | 150 | $^\circ\text{C}$ |

[1] T_{sp} is the temperature at the soldering point of the source lead.

2. Pinning information

Table 2. Discrete pinning

| Pin | Description | Simplified outline | Symbol |
|-----|---------------|--------------------|--------|
| 1 | drain (AMP A) | | |
| 2 | source | | |
| 3 | drain (AMP B) | | |
| 4 | gate1 (AMP B) | | |
| 5 | gate2 | | |
| 6 | gate1 (AMP A) | | |

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BF1207 | - | plastic surface mounted package; 6 leads | SOT363 |

4. Marking

Table 4. Marking

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| BF1207 | M2* |

- [1] * = p: Made in Hong Kong.
 * = t: Made in Malaysia.
 * = W: Made in China.

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-------------------|-------------------------|--|-----|------|------|
| Per MOSFET | | | | | |
| V_{DS} | drain-source voltage | DC | - | 6 | V |
| I_D | drain current | DC | - | 30 | mA |
| I_{G1} | gate1 current | | - | ±10 | mA |
| I_{G2} | gate2 current | | - | ±10 | mA |
| P_{tot} | total power dissipation | $T_{sp} \leq 107\text{ °C}$ ^[1] | - | 180 | mW |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| T_j | junction temperature | | - | 150 | °C |

- [1] T_{sp} is the temperature at the soldering point of the source lead.

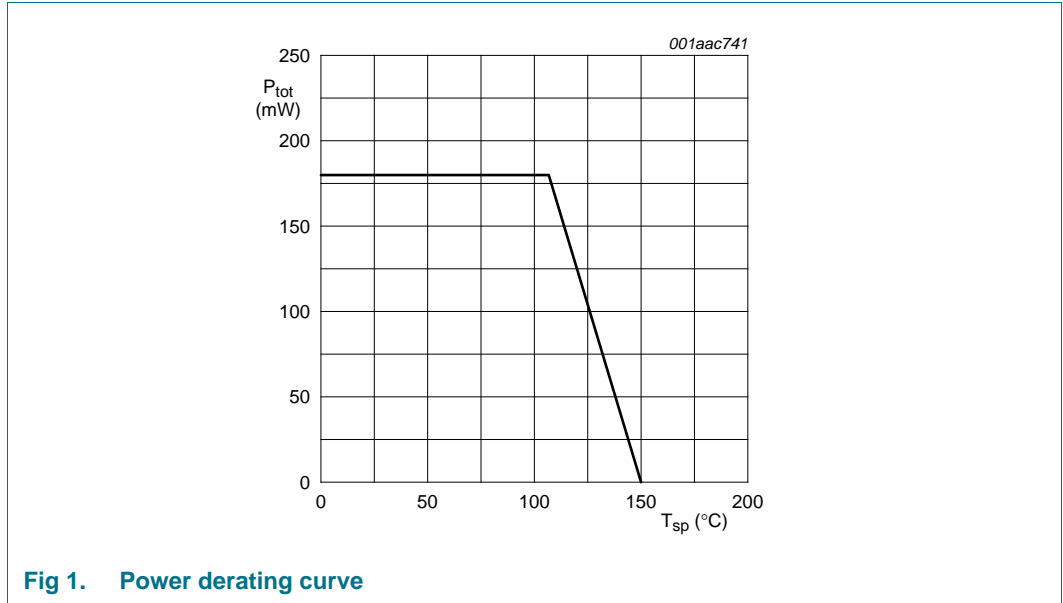


Fig 1. Power derating curve

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Typ | Unit |
|----------------|---|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to soldering point | | 240 | K/W |

7. Static characteristics

Table 7. Static characteristics

$T_j = 25^{\circ}C$.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--------------------------------|---|--------|-----|-----|------|
| Per MOSFET; unless otherwise specified | | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{G1-S} = V_{G2-S} = 0 V; I_D = 10 \mu A$ | | | | |
| | | amplifier A | 6 | - | - | V |
| | | amplifier B | 6 | - | - | V |
| $V_{(BR)G1-SS}$ | gate1-source breakdown voltage | $V_{GS} = V_{DS} = 0 V; I_{G1-S} = 10 mA$ | 6 | - | 10 | V |
| $V_{(BR)G2-SS}$ | gate2-source breakdown voltage | $V_{GS} = V_{DS} = 0 V; I_{G2-S} = 10 mA$ | 6 | - | 10 | V |
| $V_{F(S-G1)}$ | forward source-gate1 voltage | $V_{G2-S} = V_{DS} = 0 V; I_{S-G1} = 10 mA$ | 0.5 | - | 1.5 | V |
| $V_{F(S-G2)}$ | forward source-gate2 voltage | $V_{G1-S} = V_{DS} = 0 V; I_{S-G2} = 10 mA$ | 0.5 | - | 1.5 | V |
| $V_{G1-S(th)}$ | gate1-source threshold voltage | $V_{DS} = 5 V; V_{G2-S} = 4 V; I_D = 100 \mu A$ | 0.3 | - | 1.0 | V |
| $V_{G2-S(th)}$ | gate2-source threshold voltage | $V_{DS} = 5 V; V_{G1-S} = 5 V; I_D = 100 \mu A$ | 0.4 | - | 1.0 | V |
| I_{DSX} | drain-source current | $V_{G2-S} = 4 V; V_{DS} = 5 V; R_{G1} = 68 k\Omega$ | | | | |
| | | amplifier A | [1] 13 | - | 23 | mA |
| | | amplifier B | [2] 9 | - | 19 | mA |

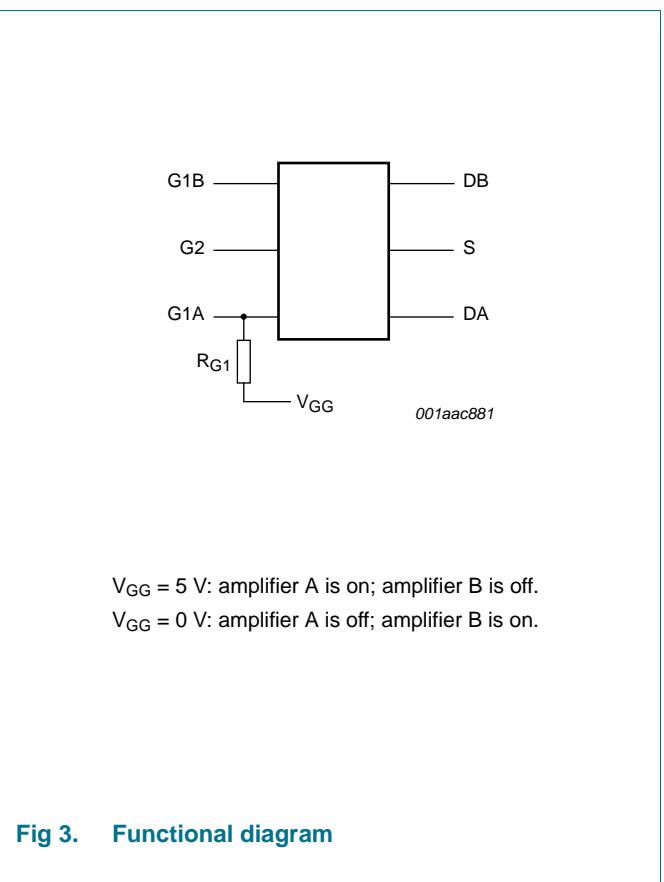
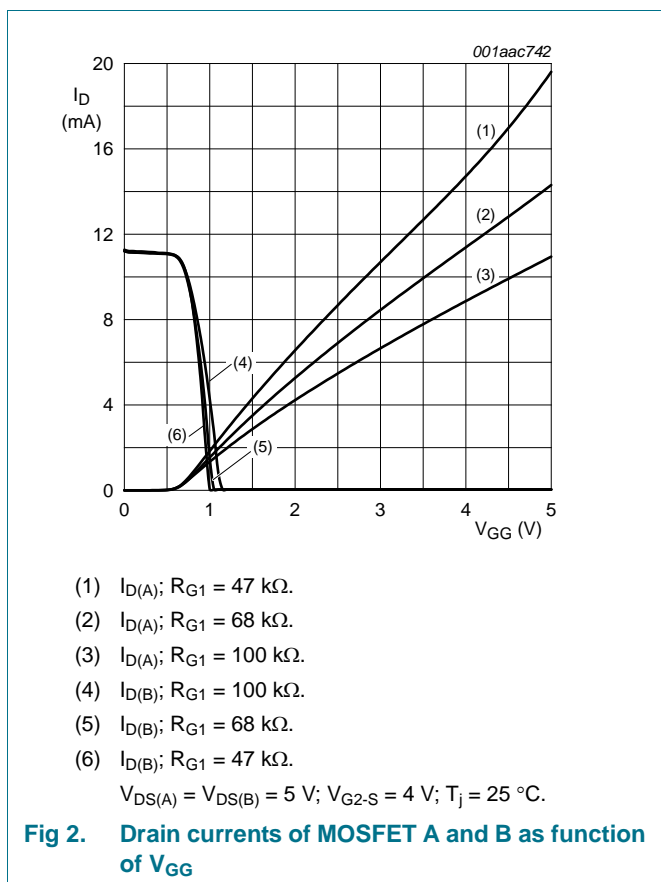
Table 7. Static characteristics ...continued

$T_j = 25\text{ }^\circ\text{C}$.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------|-----------------------|---|-----|-----|-----|------|
| I_{G1-S} | gate1 cut-off current | $V_{G2-S} = V_{DS(A)} = 0\text{ V}$ | | | | |
| | | amplifier A; $V_{G1-S(A)} = 5\text{ V}$; $V_{DS(B)} = 0\text{ V}$ | - | - | 50 | nA |
| | | amplifier B; $V_{G1-S(A)} = 0\text{ V}$; $I_{D(B)} = 0\text{ A}$ | - | - | 50 | nA |
| I_{G2-S} | gate2 cut-off current | $V_{G2-S} = 4\text{ V}$; $V_{G1-S} = V_{DS(A)} = V_{DS(B)} = 0\text{ V}$; | - | - | 20 | nA |

[1] R_{G1} connects gate1 (A) to $V_{GG} = 5\text{ V}$ (see [Figure 3](#)).

[2] R_{G1} connects gate1 (B) to $V_{GG} = 0\text{ V}$ (see [Figure 3](#)).



8. Dynamic characteristics

8.1 Dynamic characteristics for amplifier A

Table 8. Dynamic characteristics for amplifier A

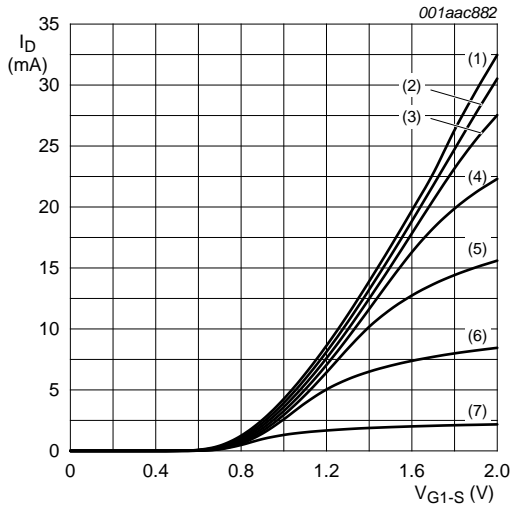
Common source; $T_{amb} = 25\text{ °C}$; $V_{G2-S} = 4\text{ V}$; $V_{DS} = 5\text{ V}$; $I_D = 18\text{ mA}$.^[1]

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|------------------------------|--|-----|-----|-----|------------|
| $ y_{fs} $ | forward transfer admittance | $T_j = 25\text{ °C}$ | 25 | 30 | 40 | mS |
| $C_{iss(G1)}$ | input capacitance at gate1 | $f = 100\text{ MHz}$ | - | 2.2 | 2.7 | pF |
| $C_{iss(G2)}$ | input capacitance at gate2 | $f = 1\text{ MHz}$ | - | 3.5 | - | pF |
| C_{oss} | output capacitance | $f = 100\text{ MHz}$ | - | 0.9 | - | pF |
| C_{rss} | reverse transfer capacitance | $f = 100\text{ MHz}$ | - | 20 | - | fF |
| G_{tr} | power gain | $B_S = B_{S(opt)}$; $B_L = B_{L(opt)}$ | | | | |
| | | $f = 200\text{ MHz}$; $G_S = 2\text{ mS}$; $G_L = 0.5\text{ mS}$ | 30 | 34 | 38 | dB |
| | | $f = 400\text{ MHz}$; $G_S = 2\text{ mS}$; $G_L = 1\text{ mS}$ | 26 | 30 | 34 | dB |
| | | $f = 800\text{ MHz}$; $G_S = 3.3\text{ mS}$; $G_L = 1\text{ mS}$ | 21 | 25 | 29 | dB |
| NF | noise figure | $f = 11\text{ MHz}$; $G_S = 20\text{ mS}$; $B_S = 0\text{ S}$ | - | 3.0 | - | dB |
| | | $f = 400\text{ MHz}$; $Y_S = Y_{S(opt)}$ | - | 1.3 | - | dB |
| | | $f = 800\text{ MHz}$; $Y_S = Y_{S(opt)}$ | - | 1.4 | - | dB |
| Xmod | cross-modulation | input level for $k = 1\%$; $f_w = 50\text{ MHz}$; $f_{unw} = 60\text{ MHz}$ | | | | |
| | | at 0 dB AGC | 90 | - | - | dB μ V |
| | | at 10 dB AGC | - | 90 | - | dB μ V |
| | | at 20 dB AGC | - | 99 | - | dB μ V |
| | | at 40 dB AGC | 100 | 105 | - | dB μ V |

[1] For the MOSFET not in use: $V_{G1-S(B)} = 0\text{ V}$; $V_{DS(B)} = 0\text{ V}$.

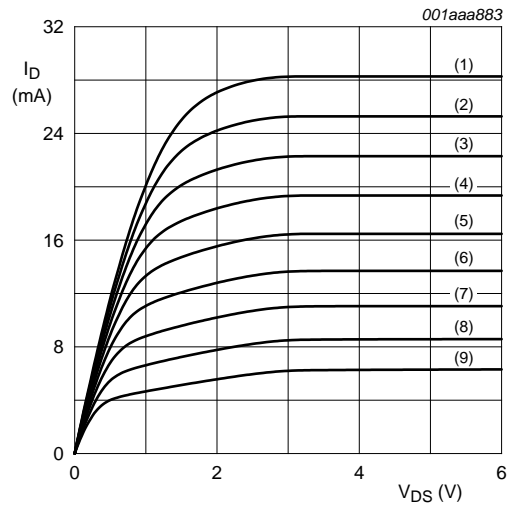
[2] Measured in [Figure 29](#) test circuit.

8.1.1 Graphs for amplifier A



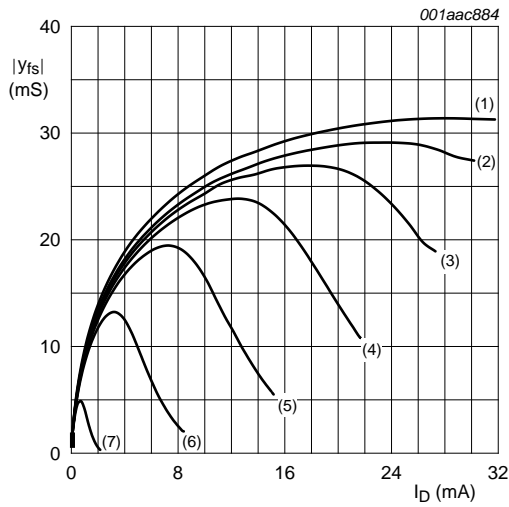
- (1) $V_{G2-S} = 4 \text{ V}$.
 - (2) $V_{G2-S} = 3.5 \text{ V}$.
 - (3) $V_{G2-S} = 3 \text{ V}$.
 - (4) $V_{G2-S} = 2.5 \text{ V}$.
 - (5) $V_{G2-S} = 2 \text{ V}$.
 - (6) $V_{G2-S} = 1.5 \text{ V}$.
 - (7) $V_{G2-S} = 1 \text{ V}$.
- $V_{DS(A)} = 5 \text{ V}$; $T_j = 25 \text{ }^\circ\text{C}$.

Fig 4. Amplifier A: transfer characteristics; typical values



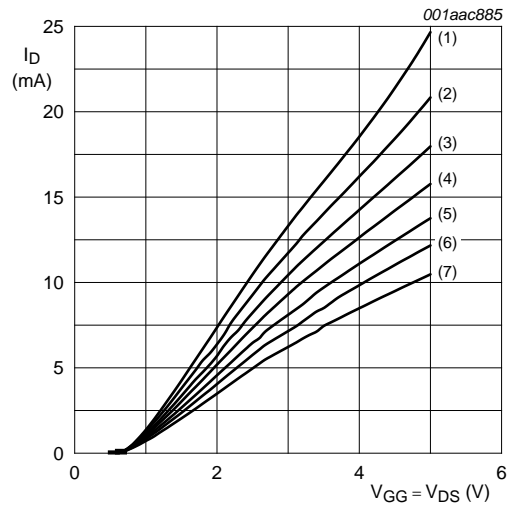
- (1) $V_{G1-S(A)} = 1.9 \text{ V}$.
 - (2) $V_{G1-S(A)} = 1.8 \text{ V}$.
 - (3) $V_{G1-S(A)} = 1.7 \text{ V}$.
 - (4) $V_{G1-S(A)} = 1.6 \text{ V}$.
 - (5) $V_{G1-S(A)} = 1.5 \text{ V}$.
 - (6) $V_{G1-S(A)} = 1.4 \text{ V}$.
 - (7) $V_{G1-S(A)} = 1.3 \text{ V}$.
 - (8) $V_{G1-S(A)} = 1.2 \text{ V}$.
 - (9) $V_{G1-S(A)} = 1.1 \text{ V}$.
- $V_{DS(A)} = 5 \text{ V}$; $V_{G2-S} = 4 \text{ V}$; $T_j = 25 \text{ }^\circ\text{C}$.

Fig 5. Amplifier A: output characteristics; typical values



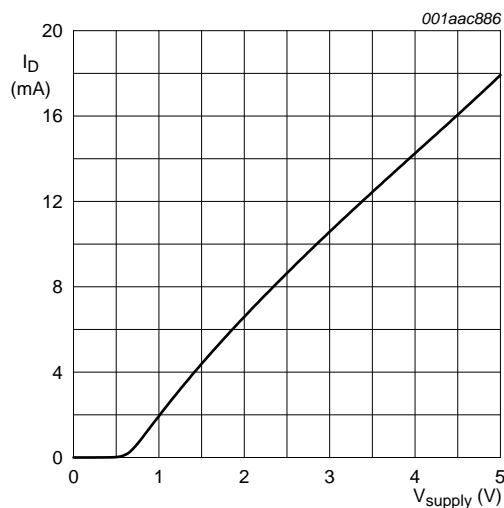
- (1) $V_{G2-S} = 4$ V.
 - (2) $V_{G2-S} = 3.5$ V.
 - (3) $V_{G2-S} = 3$ V.
 - (4) $V_{G2-S} = 2.5$ V.
 - (5) $V_{G2-S} = 2$ V.
 - (6) $V_{G2-S} = 1.5$ V.
 - (7) $V_{G2-S} = 1$ V.
- $V_{DS(A)} = 5$ V; $T_j = 25$ °C.

Fig 6. Amplifier A: forward transfer admittance as a function of drain current; typical values



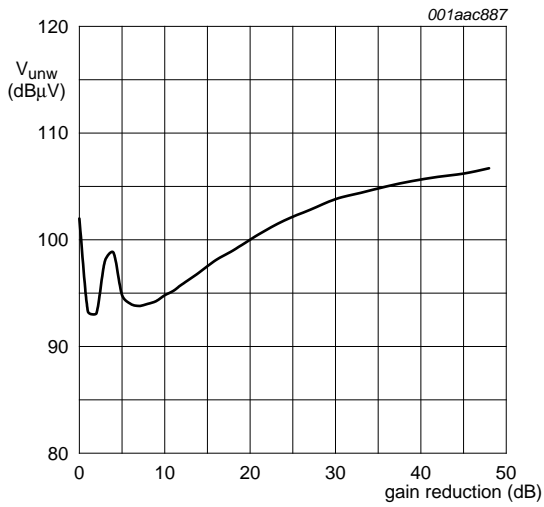
- (1) $R_{G1(A)} = 39$ kΩ.
 - (2) $R_{G1(A)} = 47$ kΩ.
 - (3) $R_{G1(A)} = 68$ kΩ.
 - (4) $R_{G1(A)} = 82$ kΩ.
 - (5) $R_{G1(A)} = 100$ kΩ.
 - (6) $R_{G1(A)} = 120$ kΩ.
 - (7) $R_{G1(A)} = 150$ kΩ.
- $V_{G2-S} = 4$ V; $T_j = 25$ °C.

Fig 7. Amplifier A: drain current as a function of V_{DS} and V_{GG} ; typical values



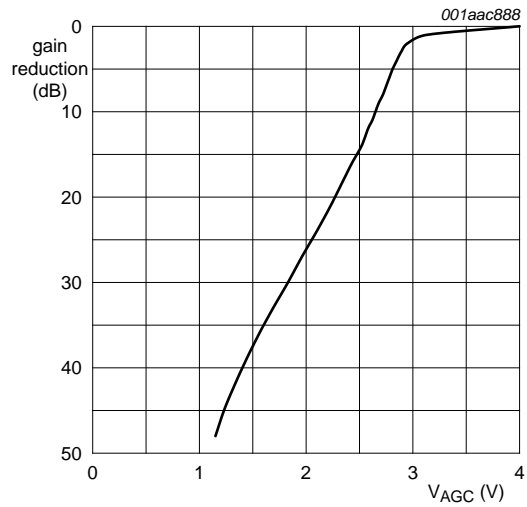
$V_{G2-S} = 4$ V, $T_j = 25$ °C, $R_{G1(B)} = 68$ kΩ (connected to ground); see Figure 3.

Fig 8. Amplifier A: drain current of amplifier A as a function of supply voltage of A and B amplifier; typical values



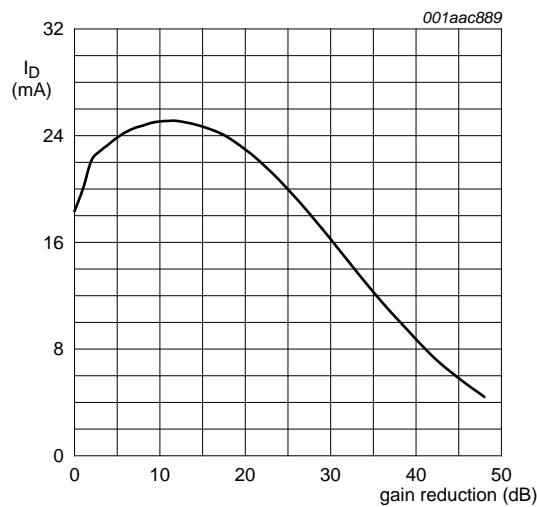
$V_{DS(A)} = V_{DS(B)} = 5\text{ V}$; $V_{G1-S(B)} = 0\text{ V}$; $f_w = 50\text{ MHz}$; $f_{unw} = 60\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$; see [Figure 29](#).

Fig 9. Amplifier A: unwanted voltage for 1 % cross-modulation as a function of gain reduction; typical values



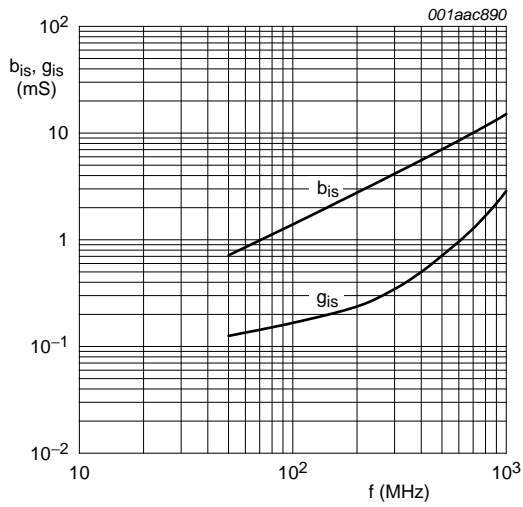
$V_{DS(A)} = V_{DS(B)} = 5\text{ V}$; $V_{G1-S(B)} = 0\text{ V}$; $f = 50\text{ MHz}$; see [Figure 29](#).

Fig 10. Amplifier A: gain reduction as a function of AGC voltage; typical values



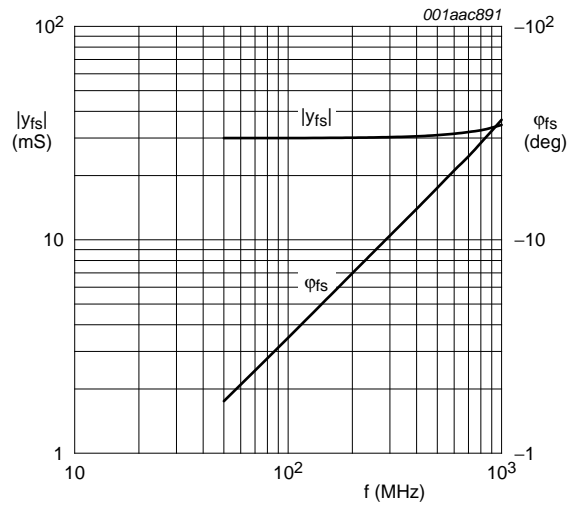
$V_{DS(A)} = V_{DS(B)} = 5\text{ V}$; $V_{G1-S(B)} = 0\text{ V}$; $f = 50\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$; see [Figure 29](#).

Fig 11. Amplifier A: drain current as a function of gain reduction; typical values



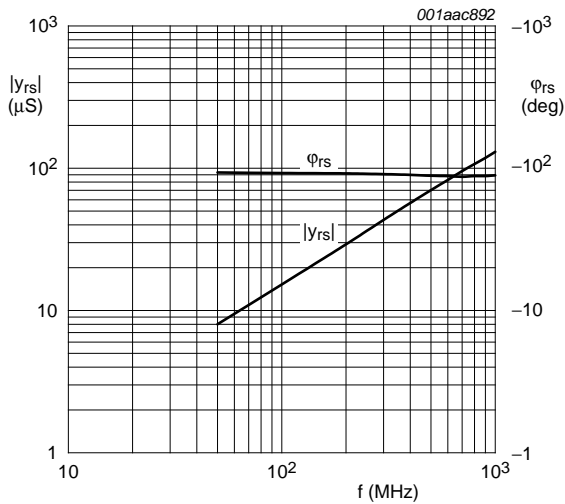
$V_{DS(A)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(B)} = V_{G1-S(B)} = 0\text{ V}; I_{D(A)} = 18\text{ mA}.$

Fig 12. Amplifier A: input admittance as a function of frequency; typical values



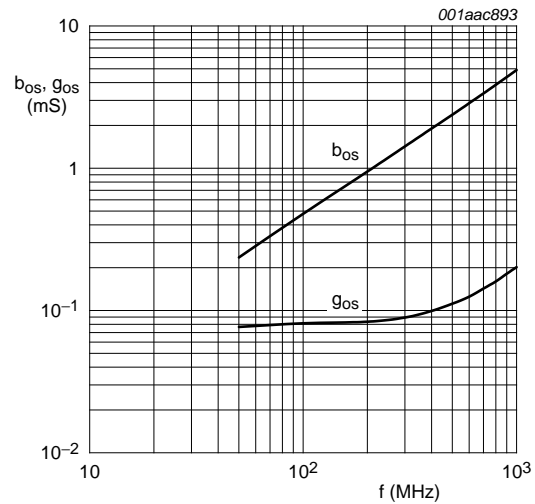
$V_{DS(A)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(B)} = V_{G1-S(B)} = 0\text{ V}; I_{D(A)} = 18\text{ mA}.$

Fig 13. Amplifier A: forward transfer admittance and phase as a function of frequency; typical values



$V_{DS(A)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(B)} = V_{G1-S(B)} = 0\text{ V}; I_{D(A)} = 18\text{ mA}.$

Fig 14. Amplifier A: reverse transfer admittance and phase as a function of frequency: typical values



$V_{DS(A)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(B)} = V_{G1-S(B)} = 0\text{ V}; I_{D(A)} = 18\text{ mA}.$

Fig 15. Amplifier A: output admittance as a function of frequency; typical values

8.1.2 Scattering parameters for amplifier A

Table 9. Scattering parameters for amplifier A

$V_{DS(A)} = 5\text{ V}$; $V_{G2-S} = 4\text{ V}$; $I_{D(A)} = 18\text{ mA}$; $V_{DS(B)} = 0\text{ V}$; $V_{G1-S(B)} = 0\text{ V}$; $T_{amb} = 25\text{ °C}$; typical values.

| f (MHz) | S ₁₁ | | S ₂₁ | | S ₁₂ | | S ₂₂ | |
|------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|
| | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) |
| 50 | 0.987 | -4.169 | 2.87 | 175.5 | 0.0008 | 83.82 | 0.992 | -1.42 |
| 100 | 0.983 | -8.109 | 2.95 | 171.14 | 0.0015 | 82.08 | 0.992 | -2.86 |
| 200 | 0.976 | -15.97 | 2.93 | 162.44 | 0.0028 | 77.50 | 0.990 | -5.66 |
| 300 | 0.966 | -23.844 | 2.89 | 153.77 | 0.0041 | 73.45 | 0.989 | -8.49 |
| 400 | 0.952 | -31.575 | 2.84 | 145.23 | 0.0053 | 69.42 | 0.986 | -11.28 |
| 500 | 0.935 | -35.225 | 2.78 | 136.82 | 0.0063 | 65.72 | 0.984 | -14.03 |
| 600 | 0.917 | -46.678 | 2.72 | 128.50 | 0.0072 | 61.48 | 0.981 | -16.80 |
| 700 | 0.898 | -54.094 | 2.65 | 120.44 | 0.0079 | 58.05 | 0.977 | -19.55 |
| 800 | 0.876 | -61.205 | 2.57 | 112.33 | 0.0084 | 52.74 | 0.974 | -22.32 |
| 900 | 0.852 | -68.299 | 2.49 | 104.32 | 0.0089 | 48.61 | 0.970 | -25.10 |
| 1000 | 0.826 | -75.321 | 2.41 | 96.42 | 0.0091 | 43.86 | 0.967 | -27.88 |

8.2 Dynamic characteristics for amplifier B

Table 10. Dynamic characteristics for amplifier B

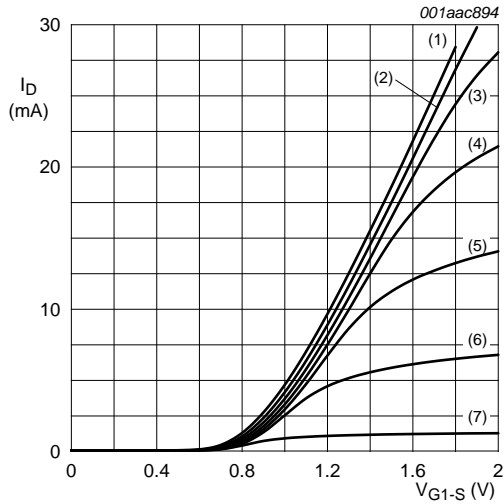
Common source; $T_{amb} = 25\text{ °C}$; $V_{G2-S} = 4\text{ V}$; $V_{DS} = 5\text{ V}$; $I_D = 14\text{ mA}$.^[1]

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|------------------------------|--|-----|-----|-----|------------|
| $ y_{fs} $ | forward transfer admittance | $T_j = 25\text{ °C}$ | 26 | 31 | 41 | mS |
| $C_{iss(G1)}$ | input capacitance at gate1 | $f = 100\text{ MHz}$ | - | 1.8 | 2.3 | pF |
| $C_{iss(G2)}$ | input capacitance at gate2 | $f = 1\text{ MHz}$ | - | 3.5 | - | pF |
| C_{oss} | output capacitance | $f = 100\text{ MHz}$ | - | 0.8 | - | pF |
| C_{rss} | reverse transfer capacitance | $f = 100\text{ MHz}$ | - | 20 | - | fF |
| G_{tr} | power gain | $B_S = B_{S(opt)}$; $B_L = B_{L(opt)}$ | | | | |
| | | $f = 200\text{ MHz}$; $G_S = 2\text{ mS}$; $G_L = 0.5\text{ mS}$ | 30 | 34 | 38 | dB |
| | | $f = 400\text{ MHz}$; $G_S = 2\text{ mS}$; $G_L = 1\text{ mS}$ | 27 | 31 | 35 | dB |
| | | $f = 800\text{ MHz}$; $G_S = 3.3\text{ mS}$; $G_L = 1\text{ mS}$ | 23 | 27 | 31 | dB |
| NF | noise figure | $f = 11\text{ MHz}$; $G_S = 20\text{ mS}$; $B_S = 0\text{ S}$ | - | 5 | - | dB |
| | | $f = 400\text{ MHz}$; $Y_S = Y_{S(opt)}$ | - | 1.3 | - | dB |
| | | $f = 800\text{ MHz}$; $Y_S = Y_{S(opt)}$ | - | 1.4 | - | dB |
| Xmod | cross-modulation | input level for $k = 1\%$; $f_w = 50\text{ MHz}$; $f_{unw} = 60\text{ MHz}$ ^[2] | | | | |
| | | at 0 dB AGC | 90 | - | - | dB μ V |
| | | at 10 dB AGC | - | 88 | - | dB μ V |
| | | at 20 dB AGC | - | 94 | - | dB μ V |
| | | at 40 dB AGC | 100 | 103 | - | dB μ V |

[1] For the MOSFET not in use: $V_{G1-S(A)} = 0\text{ V}$; $V_{DS(A)} = 0\text{ V}$.

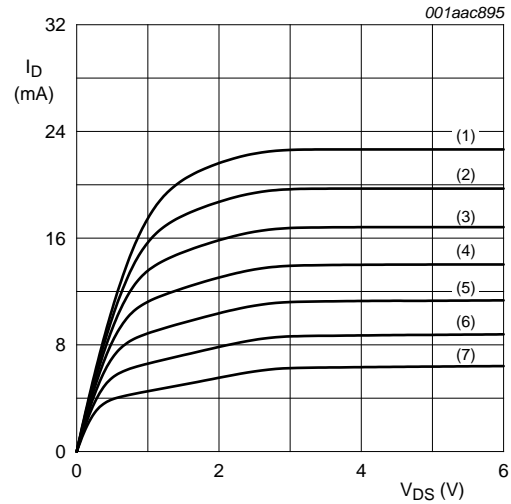
[2] Measured in [Figure 30](#) test circuit.

8.2.1 Graphs for amplifier B



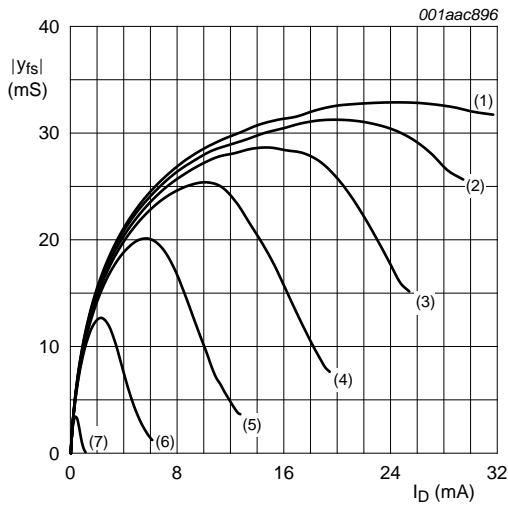
- (1) $V_{G2-S} = 4 \text{ V}$.
 - (2) $V_{G2-S} = 3.5 \text{ V}$.
 - (3) $V_{G2-S} = 3 \text{ V}$.
 - (4) $V_{G2-S} = 2.5 \text{ V}$.
 - (5) $V_{G2-S} = 2 \text{ V}$.
 - (6) $V_{G2-S} = 1.5 \text{ V}$.
 - (7) $V_{G2-S} = 1 \text{ V}$.
- $V_{DS(B)} = 5 \text{ V}; V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 16. Amplifier B: transfer characteristics; typical values



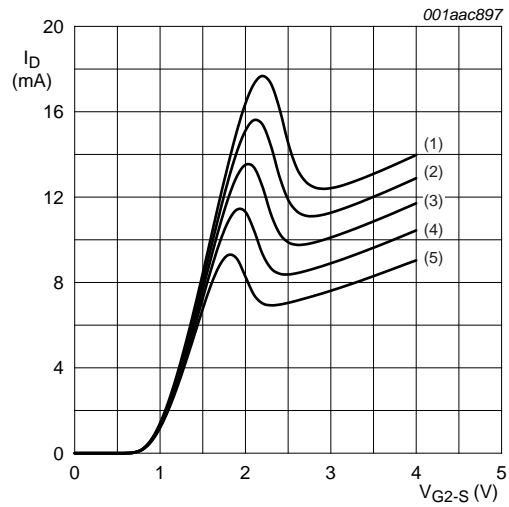
- (1) $V_{G1-S(B)} = 1.7 \text{ V}$.
 - (2) $V_{G1-S(B)} = 1.6 \text{ V}$.
 - (3) $V_{G1-S(B)} = 1.5 \text{ V}$.
 - (4) $V_{G1-S(B)} = 1.4 \text{ V}$.
 - (5) $V_{G1-S(B)} = 1.3 \text{ V}$.
 - (6) $V_{G1-S(B)} = 1.2 \text{ V}$.
 - (7) $V_{G1-S(B)} = 1.1 \text{ V}$.
- $V_{G2-S} = 4 \text{ V}; V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 17. Amplifier B: output characteristics; typical values



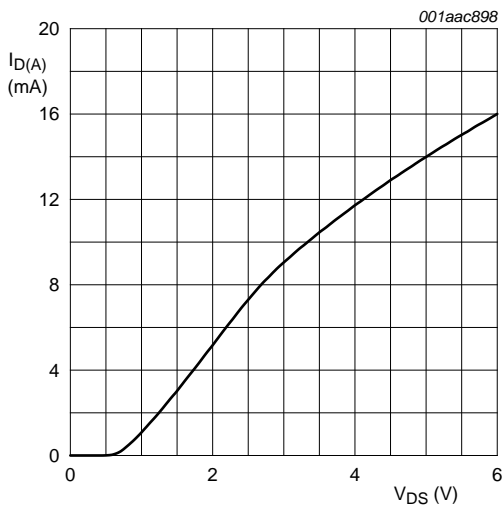
- (1) $V_{G2-S} = 4 \text{ V}$.
 - (2) $V_{G2-S} = 3.5 \text{ V}$.
 - (3) $V_{G2-S} = 3 \text{ V}$.
 - (4) $V_{G2-S} = 2.5 \text{ V}$.
 - (5) $V_{G2-S} = 2 \text{ V}$.
 - (6) $V_{G2-S} = 1.5 \text{ V}$.
 - (7) $V_{G2-S} = 1 \text{ V}$.
- $V_{DS(B)} = 5 \text{ V}; V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 18. Amplifier B: forward transfer admittance as a function of drain current; typical values



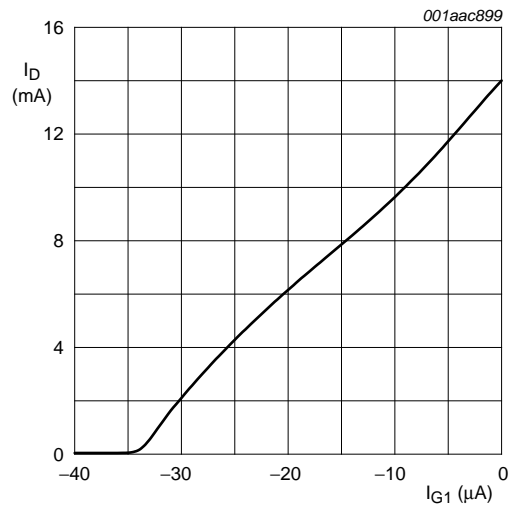
- (1) $V_{DS} = 5 \text{ V}$.
 - (2) $V_{DS} = 4.5 \text{ V}$.
 - (3) $V_{DS} = 4 \text{ V}$.
 - (4) $V_{DS} = 3.5 \text{ V}$.
 - (5) $V_{DS} = 3 \text{ V}$.
- $V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 19. Amplifier B: drain current as function of gate2 voltage; typical values



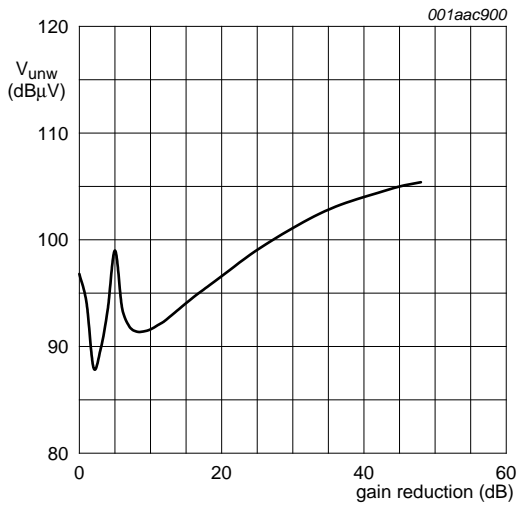
$V_{DS(B)} = 5 \text{ V}; V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 20. Amplifier B: drain current as a function of drain source voltage; typical values



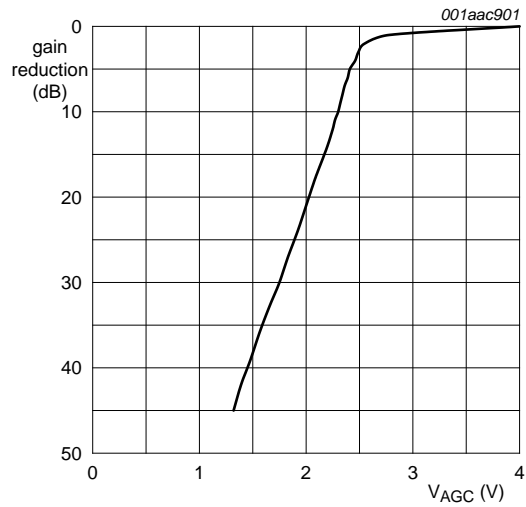
$V_{DS(B)} = 5 \text{ V}; V_{G2-S} = 4 \text{ V}; V_{G1-S(A)} = 0 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$.

Fig 21. Amplifier B: drain current as a function of gate1 current; typical values



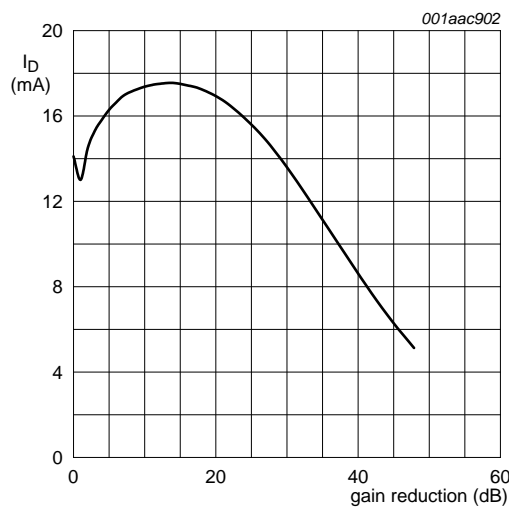
$V_{DS(B)} = 5\text{ V}$; $V_{GG} = 5\text{ V}$; $V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}$;
 $R_{G1(B)} = 150\text{ k}\Omega$ (connected to V_{GG}); $f_w = 50\text{ MHz}$;
 $f_{unw} = 60\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$; see [Figure 30](#).

Fig 22. Amplifier B: unwanted voltage for 1 % cross-modulation as a function of gain reduction; typical values



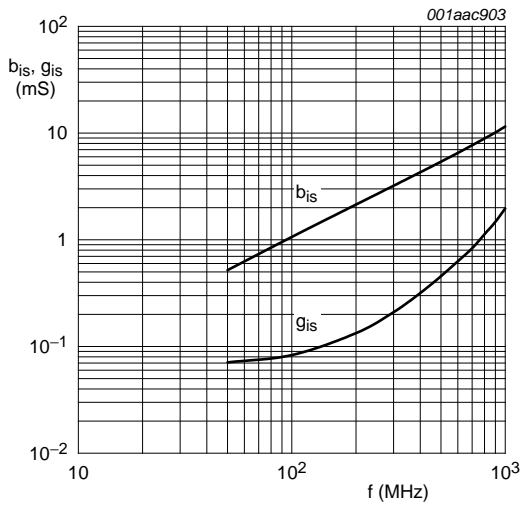
$V_{DS(B)} = 5\text{ V}$; $V_{GG} = 5\text{ V}$; $V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}$;
 $R_{G1(B)} = 150\text{ k}\Omega$ (connected to V_{GG}); $f = 50\text{ MHz}$;
 $T_{amb} = 25\text{ }^\circ\text{C}$; see [Figure 30](#).

Fig 23. Amplifier B: typical gain reduction as a function of AGC voltage; typical values



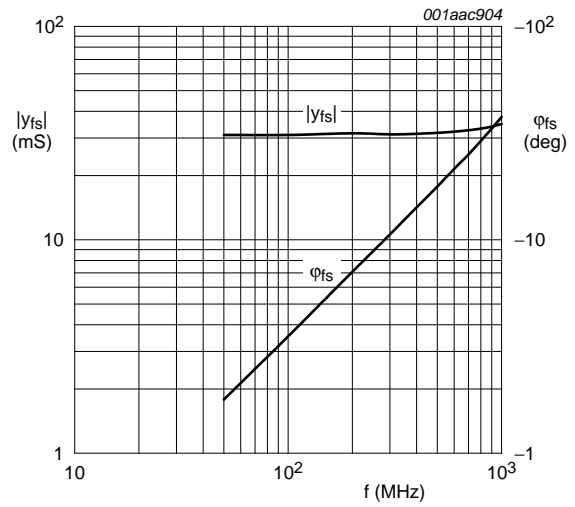
$V_{DS(B)} = 5\text{ V}$; $V_{GG} = 5\text{ V}$; $V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}$; $R_{G1(B)} = 150\text{ k}\Omega$ (connected to V_{GG}); $f = 50\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$; see [Figure 30](#).

Fig 24. Amplifier B: drain current as a function of gain reduction; typical values



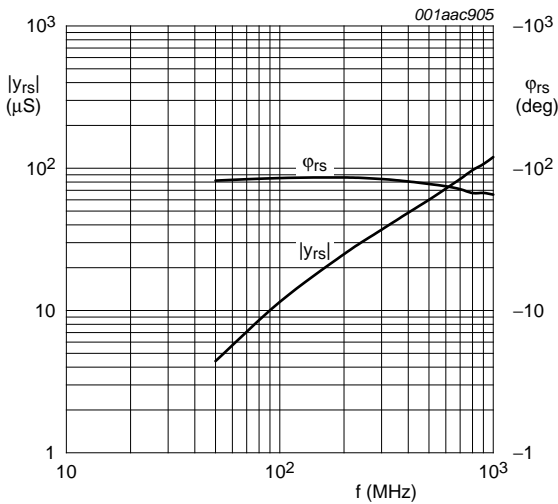
$V_{DS(B)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}; I_{D(B)} = 14\text{ mA}$.

Fig 25. Amplifier B: input admittance as a function of frequency; typical values



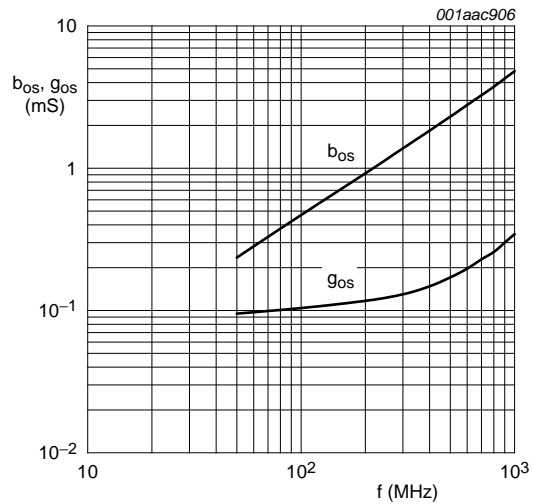
$V_{DS(B)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}; I_{D(B)} = 14\text{ mA}$.

Fig 26. Amplifier B: forward transfer admittance and phase as a function of frequency; typical values



$V_{DS(B)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}; I_{D(B)} = 14\text{ mA}$.

Fig 27. Amplifier B: reverse transfer admittance and phase as a function of frequency; typical values



$V_{DS(B)} = 5\text{ V}; V_{G2-S} = 4\text{ V}; V_{DS(A)} = V_{G1-S(A)} = 0\text{ V}; I_{D(B)} = 14\text{ mA}$.

Fig 28. Amplifier B: output admittance as a function of frequency; typical values

8.2.2 Scattering parameters for amplifier B

Table 11. Scattering parameters for amplifier B

$V_{DS(B)} = 5\text{ V}$; $V_{G2-S} = 4\text{ V}$; $I_{D(B)} = 14\text{ mA}$; $V_{DS(A)} = 0\text{ V}$; $V_{G1-S(A)} = 0\text{ V}$; $T_{amb} = 25\text{ °C}$; typical values.

| f (MHz) | S ₁₁ | | S ₂₁ | | S ₁₂ | | S ₂₂ | |
|------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|----------------------|----------------|
| | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) | Magnitude (ratio) | Angle (deg) |
| 50 | 0.993 | -3.018 | 3.07 | 176.04 | 0.0004 | 95.97 | 0.991 | -1.39 |
| 100 | 0.992 | -6.186 | 3.07 | 172.05 | 0.0011 | 90.33 | 0.990 | -2.79 |
| 200 | 0.987 | -12.43 | 3.09 | 164.13 | 0.0024 | 85.03 | 0.988 | -5.49 |
| 300 | 0.979 | -18.60 | 3.02 | 156.28 | 0.0036 | 82.94 | 0.986 | -8.21 |
| 400 | 0.969 | -24.62 | 2.99 | 148.48 | 0.0046 | 81.97 | 0.983 | -10.91 |
| 500 | 0.957 | -30.72 | 2.95 | 140.69 | 0.0056 | 81.03 | 0.980 | -13.63 |
| 600 | 0.943 | -36.71 | 2.90 | 132.87 | 0.0065 | 79.77 | 0.977 | -16.40 |
| 700 | 0.927 | -42.77 | 2.86 | 125.21 | 0.0074 | 79.04 | 0.973 | -19.13 |
| 800 | 0.907 | -48.91 | 2.79 | 117.22 | 0.0082 | 79.42 | 0.969 | -21.93 |
| 900 | 0.885 | -54.77 | 2.736 | 109.29 | 0.0086 | 75.47 | 0.964 | -24.85 |
| 1000 | 0.858 | -61.01 | 2.675 | 101.18 | 0.0092 | 73.48 | 0.958 | -27.75 |

9. Test information

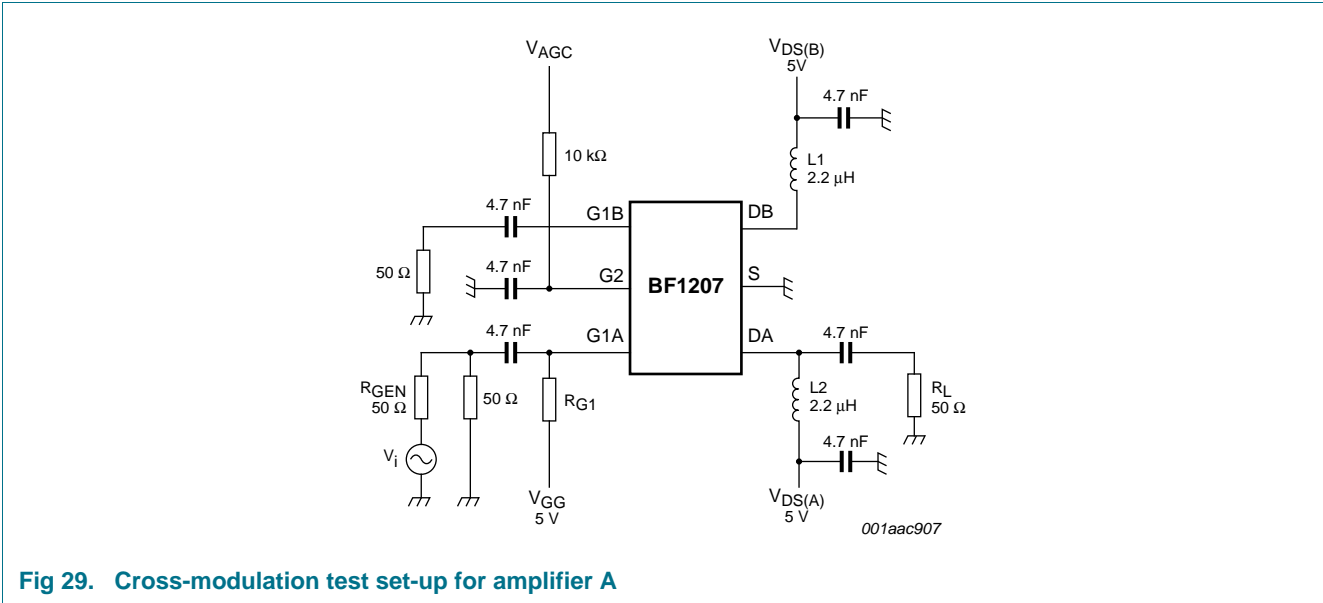


Fig 29. Cross-modulation test set-up for amplifier A

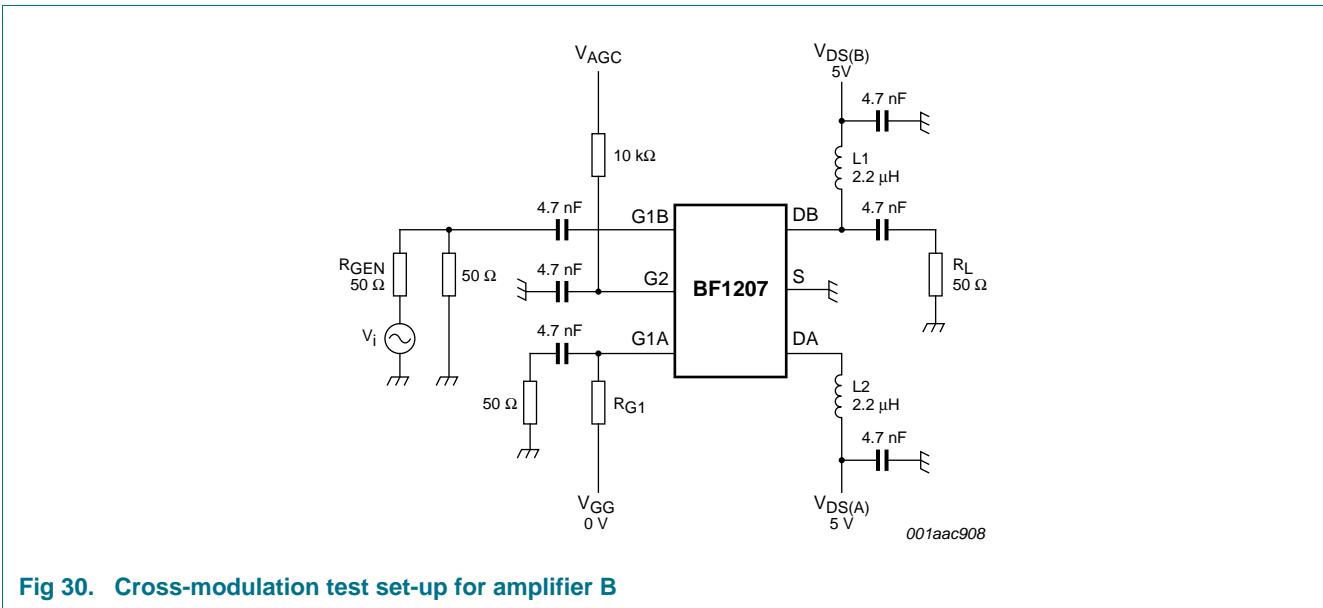


Fig 30. Cross-modulation test set-up for amplifier B

10. Package outline

Plastic surface-mounted package; 6 leads

SOT363

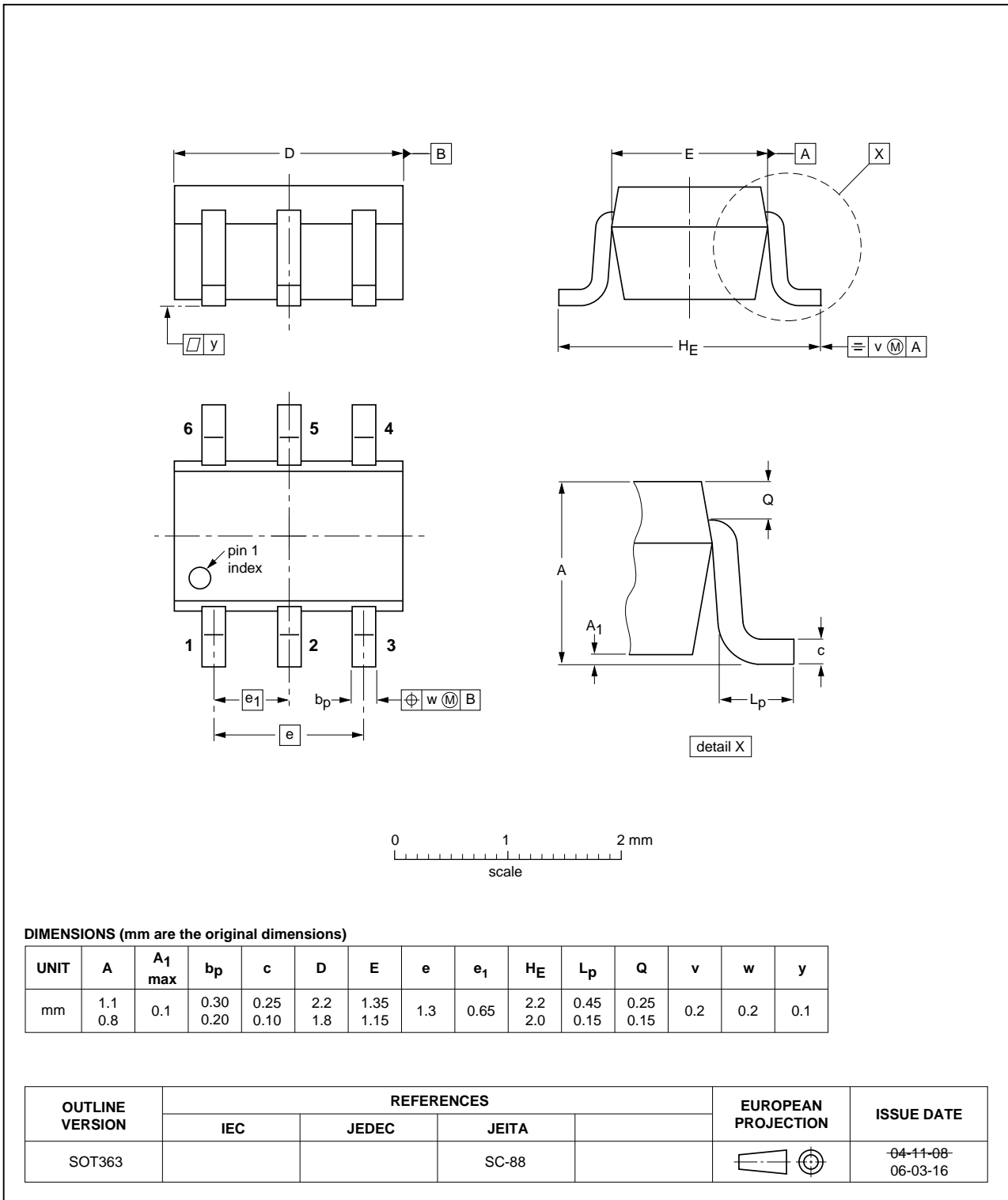


Fig 31. Package outline SOT363

11. Revision history

Table 12. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|--------------------------------|--------------|--|---------------|------------|
| BF1207 v.2 | 20110907 | Product data sheet | - | BF1207 v.1 |
| Modifications: | | <ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.• Legal texts have been adapted to the new company name where appropriate.• Package outline drawings have been updated to the latest version. | | |
| BF1207 v.1 (9397 750 14955) | 20050728 | Product data sheet | - | - |

12. Legal information

12.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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