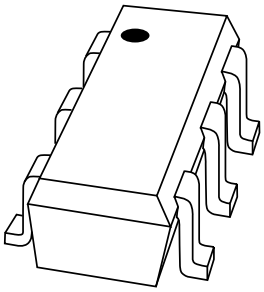
# DATA SHEET



# BF1203
## Dual N-channel dual gate MOS-FET

Product specification
Supersedes data of 2000 Dec 04

2001 Apr 25

# Dual N-channel dual gate MOS-FET BF1203

## FEATURES

- Two low noise gain controlled amplifiers in a single package
- Superior cross-modulation performance during AGC
- High forward transfer admittance
- High forward transfer admittance to input capacitance ratio.

## APPLICATIONS

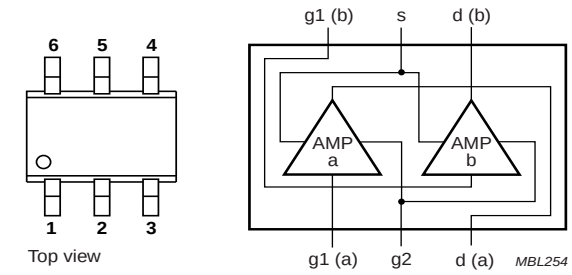
- Gain controlled low noise amplifiers for VHF and UHF applications with 3 to 9 V supply voltage, such as digital and analog television tuners and professional communications equipment.

## DESCRIPTION

The BF1203 is a combination of two different dual gate MOS-FET amplifiers with shared source and gate 2 leads. The source and substrate are interconnected.
Internal bias circuits enable DC stabilization and a very good cross-modulation performance during AGC.
Integrated diodes between the gates and source protect against excessive input voltage surges. The transistor is encapsulated in a SOT363 micro-miniature plastic package.

## PINNING - SOT363

| PIN | DESCRIPTION |
|---|---|
| 1 | gate 1 (a) |
| 2 | gate 2 |
| 3 | drain (a) |
| 4 | drain (b) |
| 5 | source |
| 6 | gate 1 (b) |




**Marking code: L2-**

Fig.1 Simplified outline and symbol.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| **Per MOS-FET unless otherwise specified** | | | | | | |
| $V_{DS}$ | drain-source voltage | | – | – | 10 | V |
| $I_D$ | drain current (DC) | | – | – | 30 | mA |
| $\lvert y_{fs} \rvert$ | forward transfer admittance | amp. a: $I_D$ = 15 mA | 23 | 28 | 35 | mS |
| | | amp. b: $I_D$ = 12 mA | 25 | 30 | 40 | mS |
| $C_{ig1\text{-}s}$ | input capacitance at gate 1 | amp. a: $I_D$ = 15 mA; f = 1 MHz | – | 2.6 | 3.1 | pF |
| | | amp. b: $I_D$ = 12 mA; f = 1 MHz | – | 1.7 | 2.2 | pF |
| $C_{rss}$ | reverse transfer capacitance | f = 1 MHz | – | 15 | – | fF |
| NF | noise figure | amp. a: f = 400 MHz; $I_D$ = 15 mA | – | 1 | 1.8 | dB |
| | | amp. b: f = 800 MHz; $I_D$ = 12 mA | – | 1.1 | 1.8 | dB |
| $X_{mod}$ | cross-modulation | amp. a: input level for k = 1% at 40 dB AGC | 105 | – | – | dBμV |
| | | amp. b: input level for k = 1% at 40 dB AGC | 100 | 105 | – | dBμV |

**CAUTION**

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Per MOS-FET unless otherwise specified** | | | | | |
| $V_{DS}$ | drain-source voltage | | – | 10 | V |
| $I_D$ | drain current (DC) | | – | 30 | mA |
| $I_{G1}$ | gate 1 current | | – | ±10 | mA |
| $I_{G2}$ | gate 2 current | | – | ±10 | mA |
| $P_{tot}$ | total power dissipation | $T_s \leq 102$ °C; note 1 | – | 200 | mW |
| $T_{stg}$ | storage temperature | | −65 | +150 | °C |
| $T_j$ | operating junction temperature | | – | 150 | °C |

**Note**

1. $T_s$ is the temperature at the soldering point of the source lead.

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $R_{th\ j\text{-}s}$ | thermal resistance from junction to soldering point | 240 | K/W |

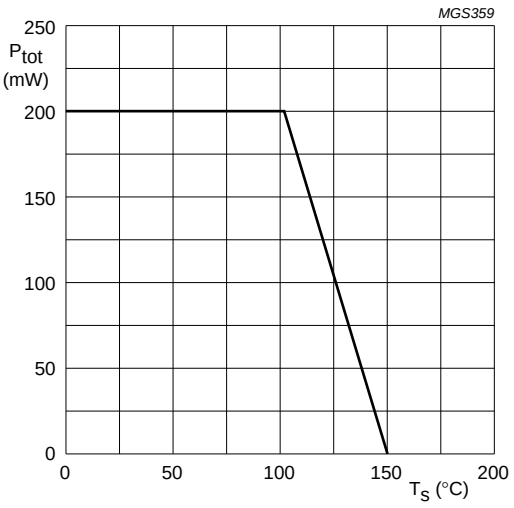



Fig.2 Power derating curve.

## STATIC CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Per MOS-FET unless otherwise specified** | | | | | |
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{G1-S} = V_{G2-S} = 0$; $I_D$ = 10 μA | 10 | – | V |
| $V_{(BR)G1-SS}$ | gate-source breakdown voltage | $V_{GS} = V_{DS} = 0$; $I_{G1-S}$ = 10 mA | 6 | 10 | V |
| $V_{(BR)G2-SS}$ | gate-source breakdown voltage | $V_{GS} = V_{DS} = 0$; $I_{G2-S}$ = 10 mA | 6 | 10 | V |
| $V_{(F)S-G1}$ | forward source-gate voltage | $V_{G2-S} = V_{DS} = 0$; $I_{S-G1}$ = 10 mA | 0.5 | 1.5 | V |
| $V_{(F)S-G2}$ | forward source-gate voltage | $V_{G1-S} = V_{DS} = 0$; $I_{S-G2}$ = 10 mA | 0.5 | 1.5 | V |
| $V_{G1-S(th)}$ | gate-source threshold voltage | $V_{DS}$ = 5 V; $V_{G2-S}$ = 4 V; $I_D$ = 100 μA | 0.3 | 1 | V |
| $V_{G2-S(th)}$ | gate-source threshold voltage | $V_{DS}$ = 5 V; $V_{G1-S}$ = 4 V; $I_D$ = 100 μA | 0.3 | 1.2 | V |
| $I_{DSX}$ | drain-source current | amp. a:<br>$V_{G2-S}$ = 4 V; $V_{DS}$ = 5 V; $R_G$ = 62 kΩ; note 1 | 11 | 19 | mA |
| | | amp. b:<br>$V_{G2-S}$ = 4 V; $V_{DS}$ = 5 V; $R_G$ = 120 kΩ; note 1 | 8 | 16 | mA |
| $I_{G1-S}$ | gate cut-off current | $V_{G1-S}$ = 5 V; $V_{G2-S} = V_{DS} = 0$ | – | 50 | nA |
| $I_{G2-S}$ | gate cut-off current | $V_{G2-S}$ = 5 V; $V_{G1-S} = V_{DS} = 0$ | – | 20 | nA |

**Note**

1. $R_{G1}$ connects gate 1 to $V_{GG}$ = 5 V.

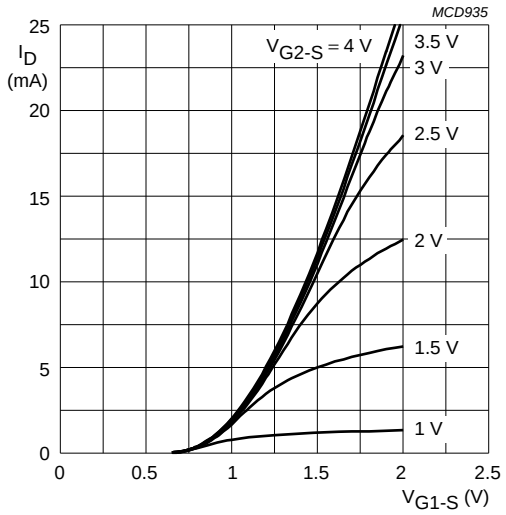
**DYNAMIC CHARACTERISTICS AMPLIFIER a**

Common source; $T_{amb}$ = 25 °C; $V_{G2-S}$ = 4 V; $V_{DS}$ = 5 V; $I_D$ = 15 mA; unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $\lvert y_{fs} \rvert$ | forward transfer admittance | pulsed; $T_j$ = 25 °C | 23 | 28 | 35 | mS |
| $C_{ig1-ss}$ | input capacitance at gate 1 | f = 1 MHz | – | 2.6 | 3.1 | pF |
| $C_{ig2-ss}$ | input capacitance at gate 2 | f = 1 MHz | – | 3 | – | pF |
| $C_{oss}$ | output capacitance | f = 1 MHz | – | 0.9 | – | pF |
| $C_{rss}$ | reverse transfer capacitance | f = 1 MHz | – | 15 | 30 | fF |
| F | noise figure | f = 10.7 MHz; $G_S$ = 20 mS; $B_S$ = 0 | – | 5 | 7 | dB |
| | | f = 400 MHz; $Y_S = Y_{S\ opt}$ | – | 1 | 1.8 | dB |
| | | f = 800 MHz; $Y_S = Y_{S\ opt}$ | – | 1.9 | 2.5 | dB |
| $G_{tr}$ | power gain | f = 200 MHz; $G_S$ = 2 mS; $B_S = B_{S\ opt}$; $G_L$ = 0.5 mS; $B_L = B_{L\ opt}$; note 1 | – | 32.5 | – | dB |
| | | f = 400 MHz; $G_S$ = 2 mS; $B_S = B_{S\ opt}$; $G_L$ = 1 mS; $B_L = B_{L\ opt}$; note 1 | – | 27 | – | dB |
| | | f = 800 MHz; $G_S$ = 3.3 mS; $B_S = B_{S\ opt}$; $G_L$ = 1 mS; $B_L = B_{L\ opt}$; note 1 | – | 21 | – | dB |
| $X_{mod}$ | cross-modulation | input level for k = 1%; $f_w$ = 50 MHz; $f_{unw}$ = 60 MHz; note 2 | | | | |
| | | at 0 dB AGC | 90 | – | – | dBμV |
| | | at 10 dB AGC | – | 95 | – | dBμV |
| | | at 40 dB AGC | 105 | – | – | dBμV |

**Notes**

1. Calculated from measured s-parameters.
2. Measured in Fig.35 test circuit.

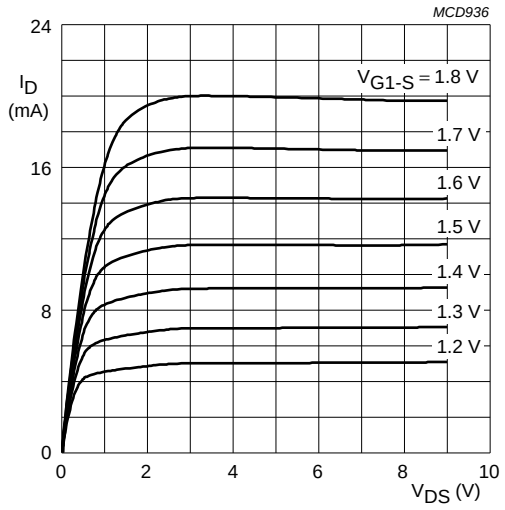



**Amplifier a**

$V_{DS}$ = 5 V.

$T_j$ = 25 °C.

Fig.3 Transfer characteristics; typical values.

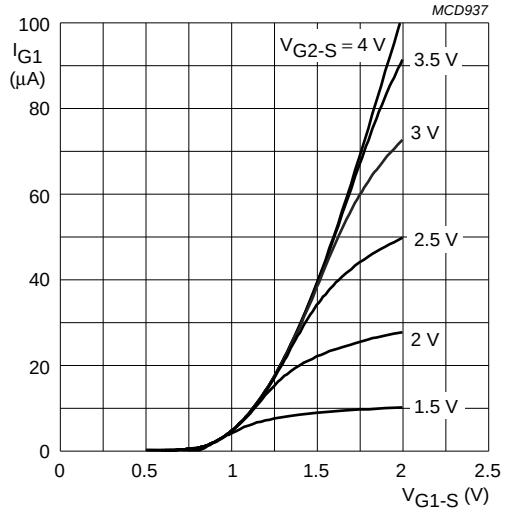



**Amplifier a**

$V_{G2-S}$ = 4 V.

$T_j$ = 25 °C.

Fig.4 Output characteristics; typical values.

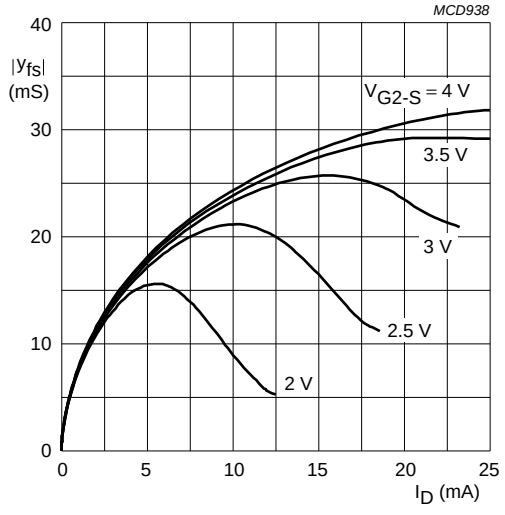



**Amplifier a**

$V_{DS}$ = 5 V.

$T_j$ = 25 °C.

Fig.5 Gate 1 current as a function of gate 1 voltage; typical values.

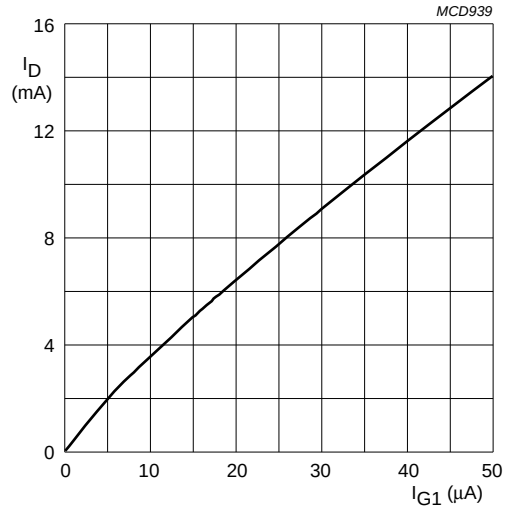



**Amplifier a**

$V_{DS}$ = 5 V.

$T_j$ = 25 °C.

Fig.6 Forward transfer admittance as a function of drain current; typical values.

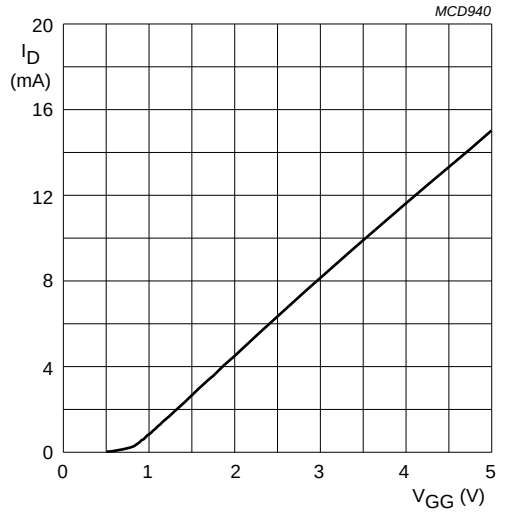



**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V.

$T_j$ = 25 °C.

Fig.7 Drain current as a function of gate 1 current; typical values.

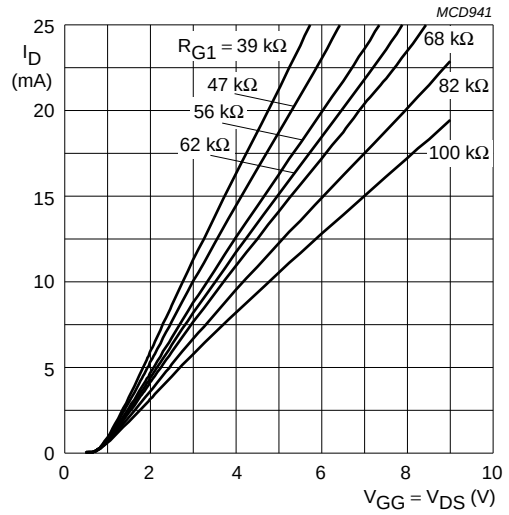



**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V; $T_j$ = 25 °C.

$R_{G1}$ = 62 kΩ (connected to $V_{GG}$); see Fig.35.

Fig.8 Drain current as a function of gate 1 supply voltage (= $V_{GG}$); typical values.

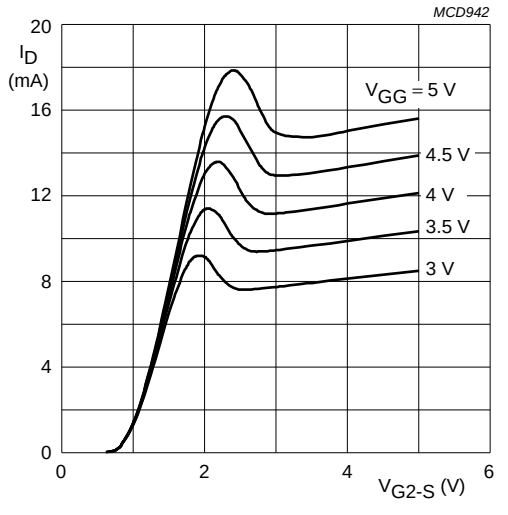



**Amplifier a**

$V_{G2\text{-}S}$ = 4 V; $T_j$ = 25 °C.

$R_{G1}$ connected to $V_{GG}$; see Fig.35.

Fig.9 Drain current as a function of gate 1 (= $V_{GG}$) and drain supply voltage; typical values.

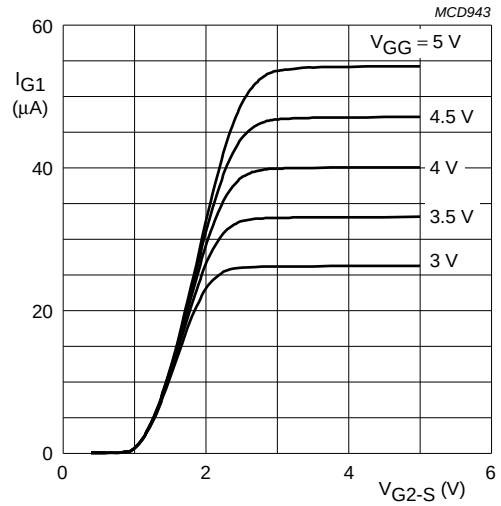



**Amplifier a**

$V_{DS}$ = 5 V; $T_j$ = 25 °C.

$R_{G1}$ = 62 kΩ (connected to $V_{GG}$); see Fig.35.

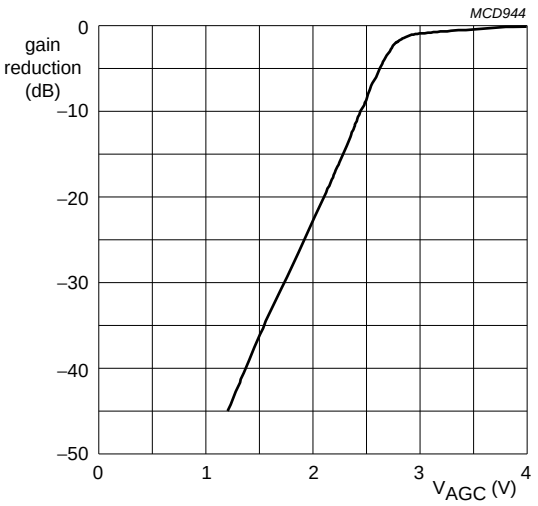
Fig.10 Drain current as a function of gate 2 voltage; typical values.




**Amplifier a**

$V_{DS}$ = 5 V; $T_j$ = 25 °C.
$R_{G1}$ = 62 kΩ (connected to $V_{GG}$); see Fig.35.

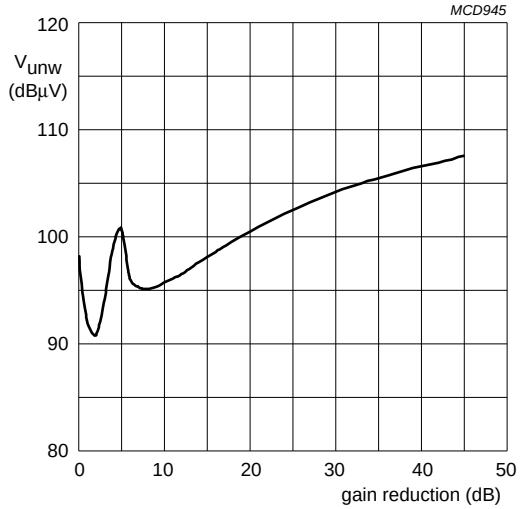
Fig.11 Gate 1 current as a function of gate 2 voltage; typical values.




**Amplifier a**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 62 kΩ;
f = 50 MHz; $T_{amb}$ = 25 °C.

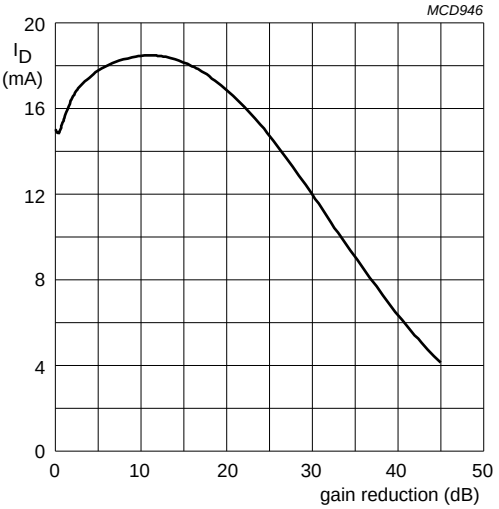
Fig.12 Typical gain reduction as a function of the AGC voltage; see Fig.35.




**Amplifier a**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 62 kΩ; f = 50 MHz;
$f_{unw}$ = 60 MHz; $T_{amb}$ = 25 °C.

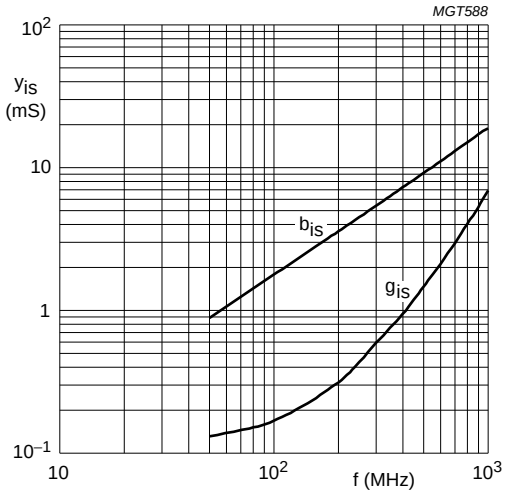
Fig.13 Unwanted voltage for 1% cross-modulation as a function of gain reduction; typical values; see Fig.35.




**Amplifier a**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 62 kΩ;
f = 50 MHz; $T_{amb}$ = 25 °C.

Fig.14 Drain current as a function of gain reduction; typical values; see Fig.35.

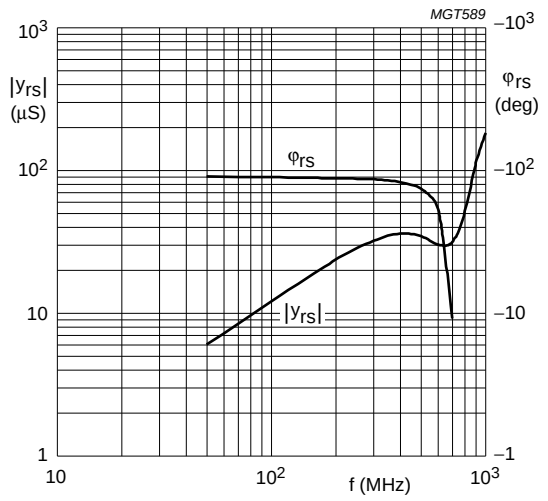



**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 15 mA; $T_{amb}$ = 25 °C.

Fig.15 Input admittance as a function of frequency; typical values.

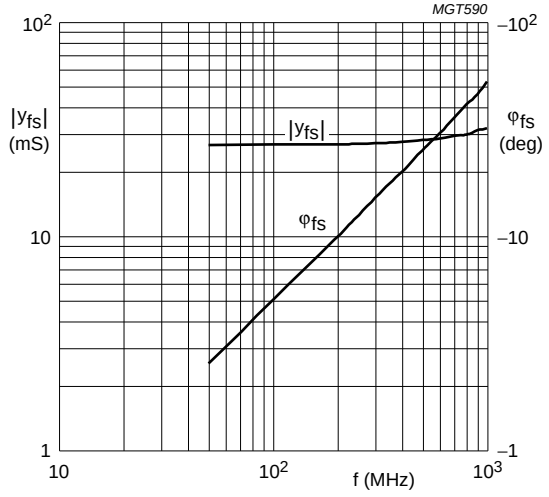



**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 15 mA; $T_{amb}$ = 25 °C.

Fig.16 Reverse transfer admittance and phase as a function of frequency; typical values.

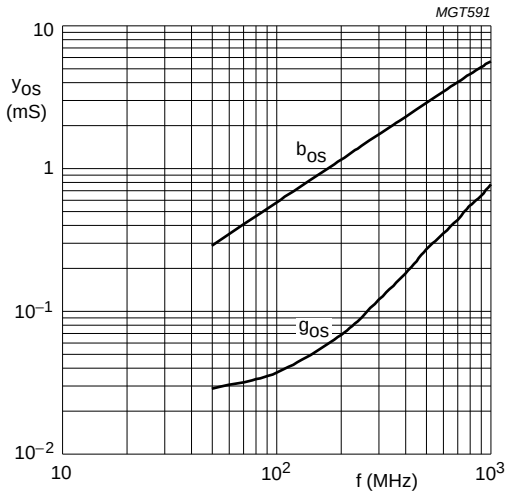



**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 15 mA; $T_{amb}$ = 25 °C.

Fig.17 Forward transfer admittance and phase as a function of frequency; typical values.




**Amplifier a**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 15 mA; $T_{amb}$ = 25 °C.

Fig.18 Output admittance as a function of frequency; typical values.

**Amplifier a scattering parameters**

**$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V; $I_D$ = 15 mA; $T_{amb}$ = 25 °C**

| 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 | −5.12 | 2.67 | 174.07 | 0.0006 | 85.79 | 0.997 | −1.72 |
| 100 | 0.983 | −10.24 | 2.66 | 168.16 | 0.0012 | 83.27 | 0.996 | −3.42 |
| 200 | 0.976 | −20.37 | 2.61 | 156.64 | 0.0023 | 78.22 | 0.992 | −6.77 |
| 300 | 0.946 | −30.36 | 2.54 | 145.05 | 0.0030 | 73.26 | 0.986 | −10.12 |
| 400 | 0.919 | −40.15 | 2.47 | 134.13 | 0.0032 | 71.40 | 0.980 | −13.33 |
| 500 | 0.885 | −49.55 | 2.37 | 132.32 | 0.0029 | 74.34 | 0.972 | −16.56 |
| 600 | 0.851 | −58.50 | 2.26 | 113.25 | 0.0024 | 90.33 | 0.965 | −19.74 |
| 700 | 0.815 | −67.28 | 2.15 | 103.20 | 0.0023 | 129.94 | 0.960 | −22.90 |
| 800 | 0.778 | −75.03 | 2.02 | 93.78 | 0.0035 | 172.18 | 0.950 | −26.05 |
| 900 | 0.747 | −83.30 | 1.95 | 84.84 | 0.0070 | 171.55 | 0.951 | −29.10 |
| 1000 | 0.710 | −90.47 | 1.83 | 75.92 | 0.0104 | 172.88 | 0.947 | −32.25 |

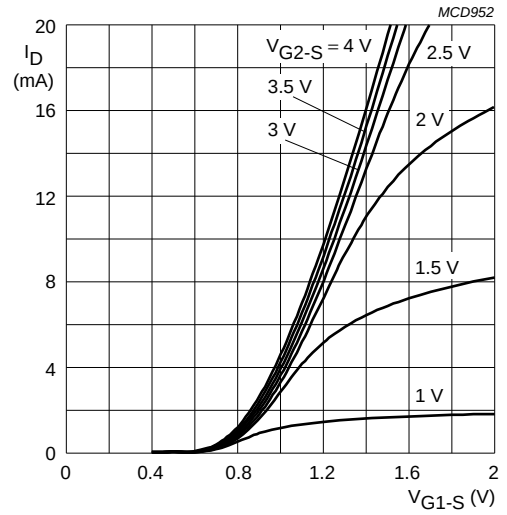
**DYNAMIC CHARACTERISTICS AMPLIFIER b**

Common source; $T_{amb}$ = 25 °C; $V_{G2-S}$ = 4 V; $V_{DS}$ = 5 V; $I_D$ = 12 mA; unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $\lvert y_{fs} \rvert$ | forward transfer admittance | pulsed; $T_j$ = 25 °C | 25 | 30 | 40 | mS |
| $C_{ig1-ss}$ | input capacitance at gate 1 | f = 1 MHz | – | 1.7 | 2.2 | pF |
| $C_{ig2-ss}$ | input capacitance at gate 2 | f = 1 MHz | – | 4 | – | pF |
| $C_{oss}$ | output capacitance | f = 1 MHz | – | 0.85 | – | pF |
| $C_{rss}$ | reverse transfer capacitance | f = 1 MHz | – | 15 | 30 | fF |
| F | noise figure | f = 10.7 MHz; $G_S$ = 20 mS; $B_S$ = 0 | – | 9 | 11 | dB |
| | | f = 400 MHz; $Y_S = Y_{S\ opt}$ | – | 0.9 | 1.5 | dB |
| | | f = 800 MHz; $Y_S = Y_{S\ opt}$ | – | 1.1 | 1.8 | dB |
| $G_{tr}$ | power gain | f = 200 MHz; $G_S$ = 2 mS; $B_S = B_{S\ opt}$; $G_L$ = 0.5 mS; $B_L = B_{L\ opt}$; note 1 | – | 34 | – | dB |
| | | f = 400 MHz; $G_S$ = 2 mS; $B_S = B_{S\ opt}$; $G_L$ = 1 mS; $B_L = B_{L\ opt}$; note 1 | – | 30 | – | dB |
| | | f = 800 MHz; $G_S$ = 3.3 mS; $B_S = B_{S\ opt}$; $G_L$ = 1 mS; $B_L = B_{L\ opt}$; note 1 | – | 25 | – | dB |
| $X_{mod}$ | cross-modulation | input level for k = 1%; $f_w$ = 50 MHz; $f_{unw}$ = 60 MHz; note 2 | | | | |
| | | at 0 dB AGC | 90 | – | – | dBμV |
| | | at 10 dB AGC | – | 92 | – | dBμV |
| | | at 40 dB AGC | 100 | 105 | – | dBμV |

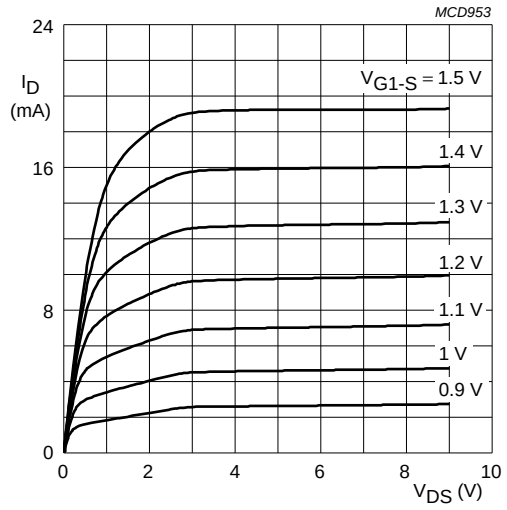
**Notes**

1. Calculated from measured s-parameters.
2. Measured in Fig.35 test circuit.



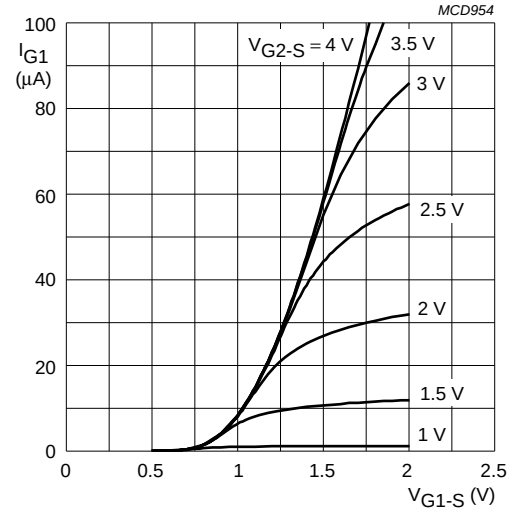

**Amplifier b**
$V_{DS}$ = 5 V.
$T_j$ = 25 °C.

Fig.19 Transfer characteristics; typical values.



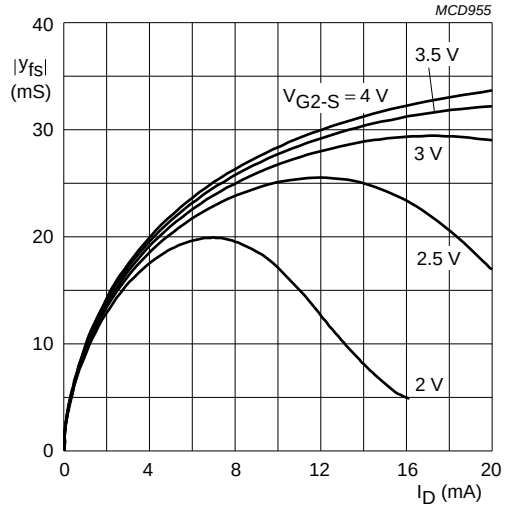

**Amplifier b**
$V_{G2-S}$ = 4 V.
$T_j$ = 25 °C.

Fig.20 Output characteristics; typical values.



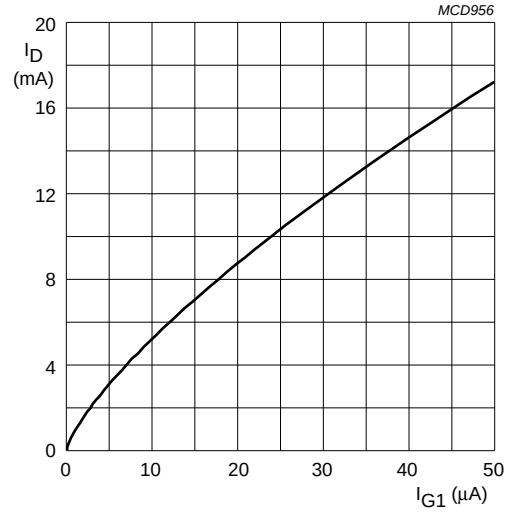

**Amplifier b**
$V_{DS}$ = 5 V.
$T_j$ = 25 °C.

Fig.21 Gate 1 current as a function of gate 1 voltage; typical values.




**Amplifier b**
$V_{DS}$ = 5 V.
$T_j$ = 25 °C.

Fig.22 Forward transfer admittance as a function of drain current; typical values.

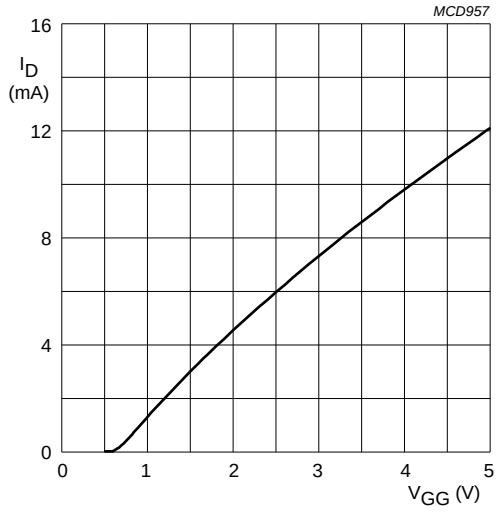



**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V.

$T_j$ = 25 °C.

Fig.23 Drain current as a function of gate 1 current; typical values.

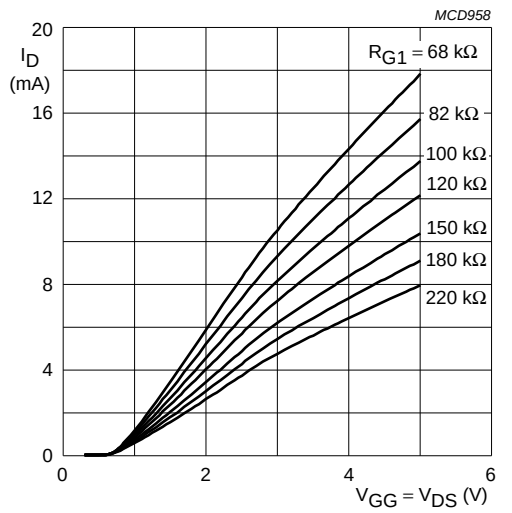



**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V; $T_j$ = 25 °C.

$R_{G1}$ = 120 kΩ (connected to $V_{GG}$); see Fig.35.

Fig.24 Drain current as a function of gate 1 supply voltage (= $V_{GG}$); typical values.

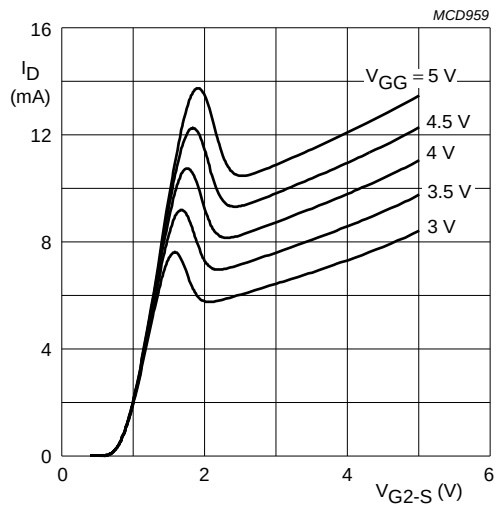



**Amplifier b**

$V_{G2\text{-}S}$ = 4 V; $T_j$ = 25 °C.

$R_{G1}$ connected to $V_{GG}$; see Fig.35.

Fig.25 Drain current as a function of gate 1 (= $V_{GG}$) and drain supply voltage; typical values.

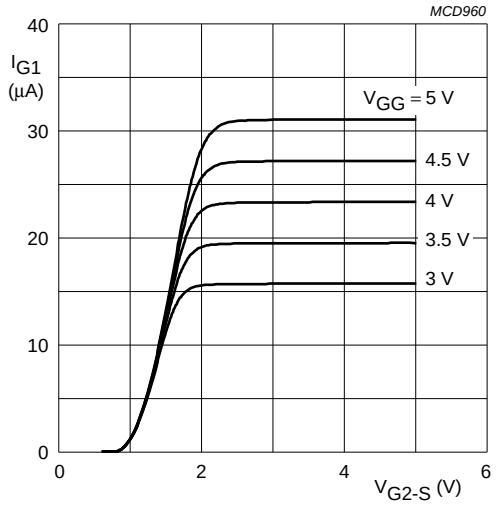



**Amplifier b**

$V_{DS}$ = 5 V; $T_j$ = 25 °C.

$R_{G1}$ = 120 kΩ (connected to $V_{GG}$); see Fig.35.

Fig.26 Drain current as a function of gate 2 voltage; typical values.

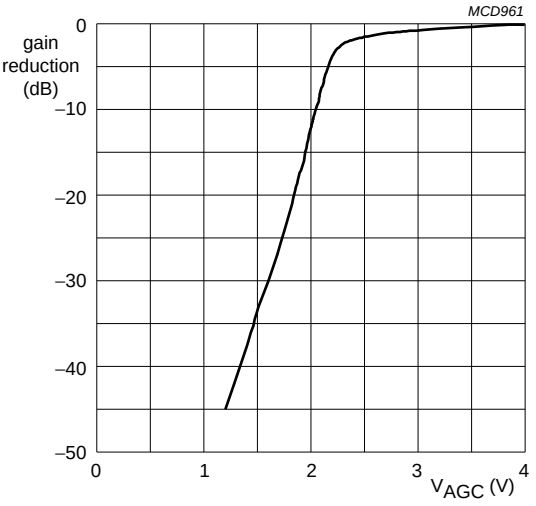



**Amplifier b**

$V_{DS}$ = 5 V; $T_j$ = 25 °C.

$R_{G1}$ = 120 kΩ (connected to $V_{GG}$); see Fig.35.

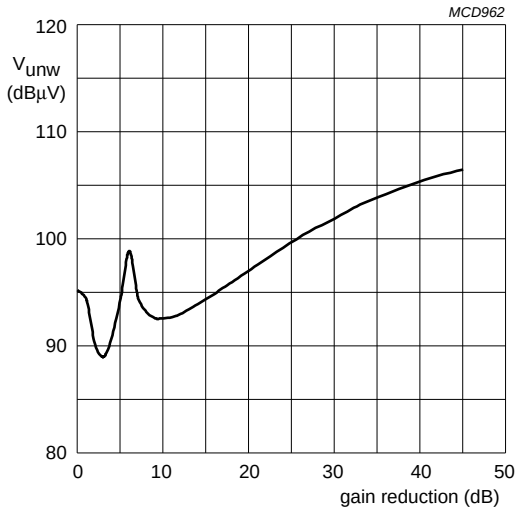
Fig.27 Gate 1 current as a function of gate 2 voltage; typical values.




**Amplifier b**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 120 kΩ;
f = 50 MHz; $T_{amb}$ = 25 °C.

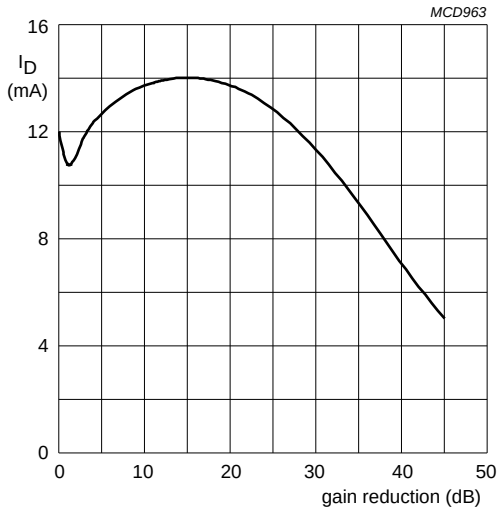
Fig.28 Typical gain reduction as a function of the AGC voltage; see Fig.35.




**Amplifier b**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 120 kΩ;
f= 50 MHz; $f_{unw}$ = 60 MHz; $T_{amb}$ = 25 °C.

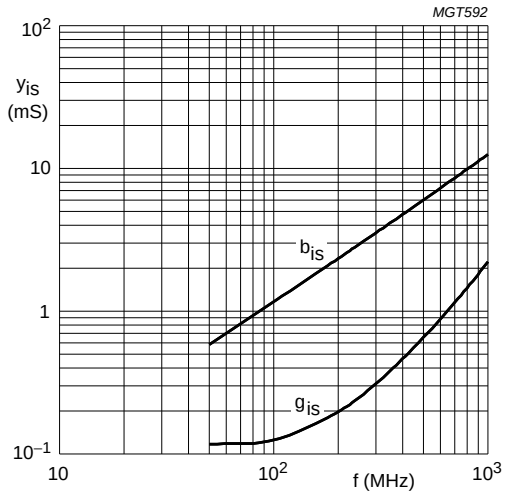
Fig.29 Unwanted voltage for 1% cross-modulation as a function of gain reduction; typical values; see Fig.35.




**Amplifier b**

$V_{DS}$ = 5 V; $V_{GG}$ = 5 V; $R_{G1}$ = 120 kΩ;
f = 50 MHz; $T_{amb}$ = 25 °C.

Fig.30 Drain current as a function of gain reduction; typical values; see Fig.35.

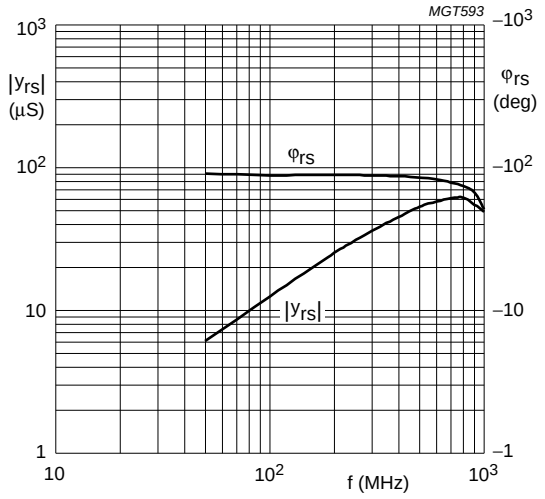



**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 12 mA; $T_{amb}$ = 25 °C.

Fig.31 Input admittance as a function of frequency; typical values.

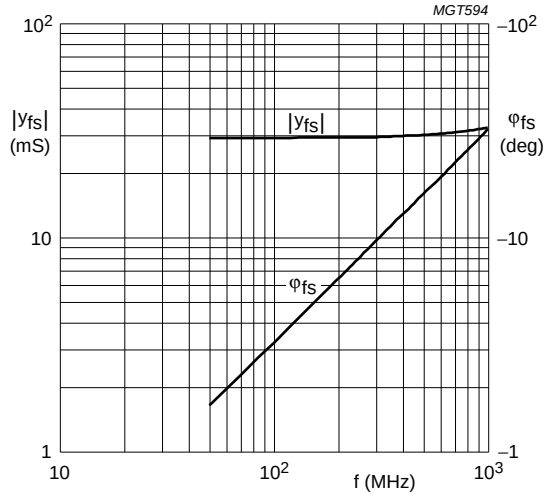



**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 12 mA; $T_{amb}$ = 25 °C.

Fig.32 Reverse transfer admittance and phase as a function of frequency; typical values.

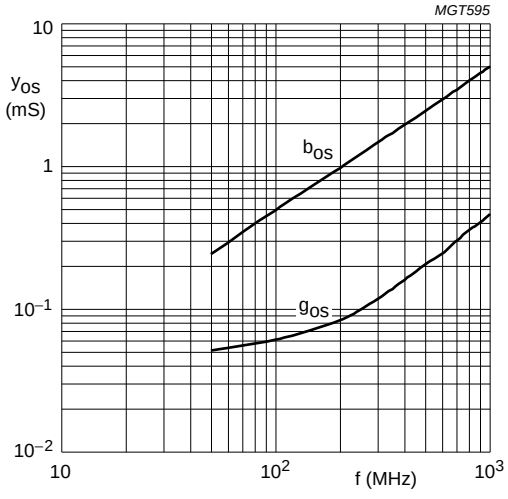



**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 12 mA; $T_{amb}$ = 25 °C.

Fig.33 Forward transfer admittance and phase as a function of frequency; typical values.




**Amplifier b**

$V_{DS}$ = 5 V; $V_{G2}$ = 4 V.

$I_D$ = 12 mA; $T_{amb}$ = 25 °C.

Fig.34 Output admittance as a function of frequency; typical values.

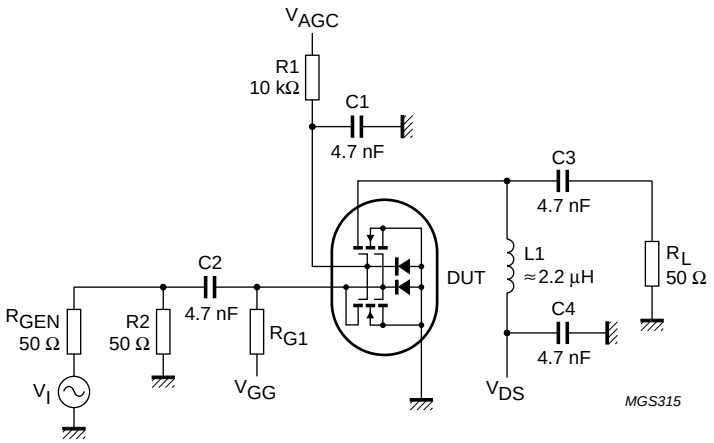



Fig.35 Cross-modulation test set-up (for one MOS-FET).

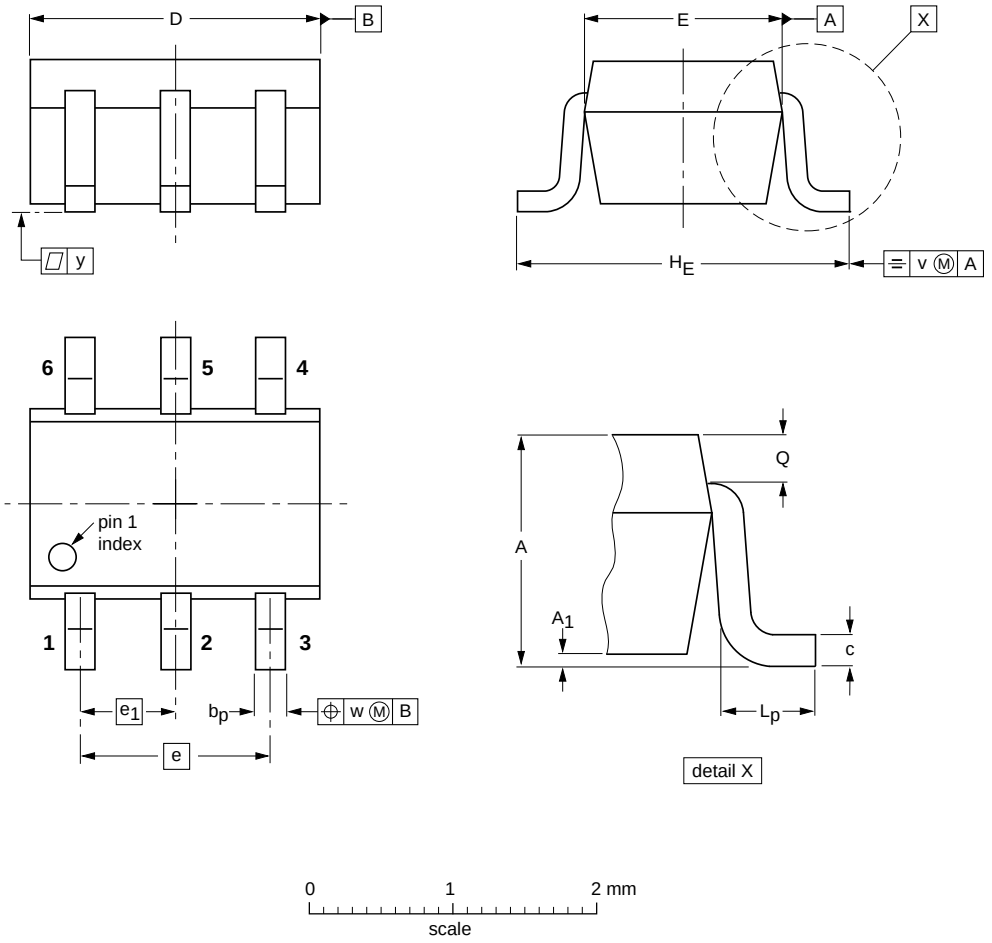
**Amplifier b scattering parameters**

**$V_{DS}$ = 5 V; $V_{G2\text{-}S}$ = 4 V; $I_D$ = 12 mA; $T_{amb}$ = 25 °C**

| 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 | 0.988 | –3.30 | 2.93 | 166.05 | 0.0006 | 87.62 | 0.994 | –1.45 |
| 100 | 0.987 | –6.60 | 2.92 | 172.11 | 0.0013 | 86.02 | 0.993 | –2.92 |
| 200 | 0.981 | –13.19 | 2.90 | 164.49 | 0.0025 | 82.03 | 0.990 | –5.72 |
| 300 | 0.969 | –19.81 | 2.87 | 156.59 | 0.0036 | 76.76 | 0.986 | –8.57 |
| 400 | 0.957 | –26.42 | 2.84 | 149.17 | 0.0045 | 73.59 | 0.981 | –11.32 |
| 500 | 0.941 | –33.04 | 2.79 | 141.47 | 0.0051 | 71.13 | 0.975 | –14.22 |
| 600 | 0.925 | –39.44 | 2.73 | 134.25 | 0.0054 | 69.07 | 0.971 | –17.04 |
| 700 | 0.907 | –45.89 | 2.67 | 126.81 | 0.0055 | 68.03 | 0.966 | –19.92 |
| 800 | 0.889 | –51.93 | 2.60 | 119.56 | 0.0055 | 68.55 | 0.958 | –22.77 |
| 900 | 0.827 | –57.82 | 2.54 | 112.70 | 0.0048 | 69.87 | 0.957 | –25.54 |
| 1000 | 0.853 | –63.24 | 2.46 | 105.72 | 0.0042 | 78.19 | 0.954 | –28.41 |

## PACKAGE OUTLINE

**Plastic surface-mounted package; 6 leads** **SOT363**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ max | $b_p$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | Q | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.8 | 0.1 | 0.30<br>0.20 | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65 | 2.2<br>2.0 | 0.45<br>0.15 | 0.25<br>0.15 | 0.2 | 0.2 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT363 | | | SC-88 | | | ~~04-11-08~~<br>06-03-16 |

**DATA SHEET STATUS**

| DOCUMENT STATUS[1] | PRODUCT STATUS[2] | DEFINITION |
|---|---|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

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