

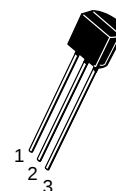
JFET VHF/UHF Amplifiers

N-Channel — Depletion

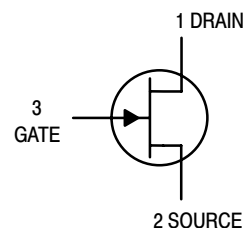
2N5484
2N5486

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain–Gate Voltage	V_{DG}	25	Vdc
Reverse Gate–Source Voltage	V_{GSR}	25	Vdc
Drain Current	I_D	30	mAdc
Forward Gate Current	$I_{G(f)}$	10	mAdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +150	$^\circ\text{C}$



CASE 29–11, STYLE 5
TO–92 (TO–226AA)



2N5484 2N5486

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Gate–Source Breakdown Voltage (I _G = –1.0 μ Adc, V _{DS} = 0)	V _{(BR)GSS}	–25	—	—	Vdc
Gate Reverse Current (V _{GS} = –20 Vdc, V _{DS} = 0) (V _{GS} = –20 Vdc, V _{DS} = 0, T _A = 100°C)	I _{GSS}	— —	— —	–1.0 –0.2	nAdc μ Adc
Gate Source Cutoff Voltage (V _{DS} = 15 Vdc, I _D = 10 nAdc)	V _{GS(off)}	–0.3 –2.0	— —	–3.0 –6.0	Vdc

ON CHARACTERISTICS

Zero–Gate–Voltage Drain Current (V _{DS} = 15 Vdc, V _{GS} = 0)	I _{DSS}	1.0 8.0	— —	5.0 20	mAdc
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SMALL–SIGNAL CHARACTERISTICS

Forward Transfer Admittance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 1.0 kHz)	y _{fs}	3000 4000	— —	6000 8000	μ hos
Input Admittance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 100 MHz) (V _{DS} = 15 Vdc, V _{GS} = 0, f = 400 MHz)	Re(y _{is})	— —	— —	100 1000	μ hos
Output Admittance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 1.0 kHz)	y _{os}	— —	— —	50 75	μ hos
Output Conductance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 100 MHz) (V _{DS} = 15 Vdc, V _{GS} = 0, f = 400 MHz)	Re(y _{os})	— —	— —	75 100	μ hos
Forward Transconductance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 100 MHz) (V _{DS} = 15 Vdc, V _{GS} = 0, f = 400 MHz)	Re(y _{fs})	2500 3500	— —	— —	μ hos

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
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SMALL-SIGNAL CHARACTERISTICS (continued)

Input Capacitance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	—	—	5.0	pF
Reverse Transfer Capacitance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{rss}	—	—	1.0	pF
Output Capacitance (V _{DS} = 15 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{oss}	—	—	2.0	pF

FUNCTIONAL CHARACTERISTICS

Noise Figure (V _{DS} = 15 Vdc, V _{GS} = 0, R _G = 1.0 Megohm, f = 1.0 kHz) (V _{DS} = 15 Vdc, I _D = 1.0 mA, R _G ≈ 1.0 kΩ, f = 100 MHz) 4 (V _{DS} = 15 Vdc, I _D = 1.0 mA, R _G ≈ 1.0 kΩ, f = 200 MHz) 4 (V _{DS} = 15 Vdc, I _D = 4.0 mA, R _G ≈ 1.0 kΩ, f = 100 MHz) 6 (V _{DS} = 15 Vdc, I _D = 4.0 mA, R _G ≈ 1.0 kΩ, f = 400 MHz) 6	2N548 2N548 2N548 2N548 2N548 2N548	NF	— — — — — —	— — 4.0 — — —	2.5 3.0 — 2.0 4.0 —	dB
Common Source Power Gain (V _{DS} = 15 Vdc, I _D = 1.0 mA, f = 100 MHz) 4 (V _{DS} = 15 Vdc, I _D = 1.0 mA, f = 200 MHz) 4 (V _{DS} = 15 Vdc, I _D = 4.0 mA, f = 100 MHz) 6 (V _{DS} = 15 Vdc, I _D = 4.0 mA, f = 400 MHz) 6	2N548 2N548 2N548 2N548 2N548	G _{ps}	16 — 18 10	— 14 — —	25 — 30 20	dB

POWER GAIN

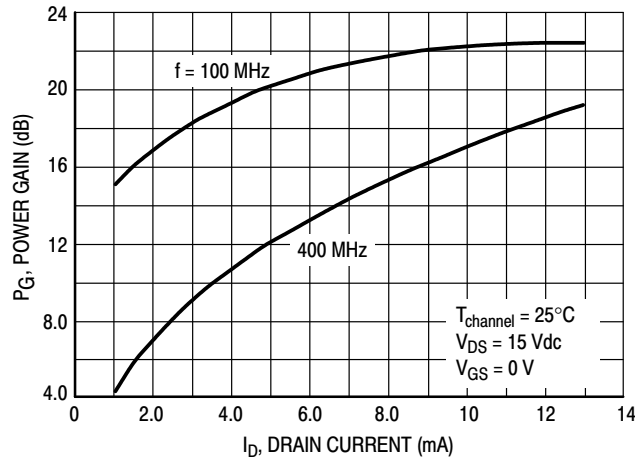
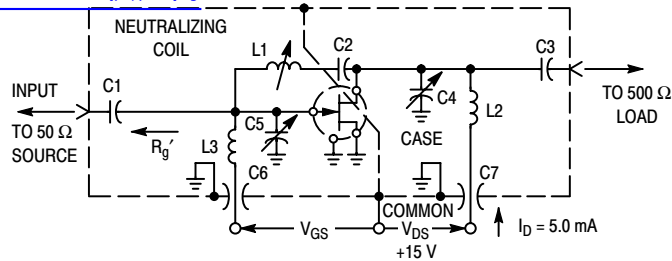


Figure 1. Effects of Drain Current

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Adjust V_{GS} for
 $I_D = 50 \text{ mA}$
 $V_{GS} < 0 \text{ Volts}$

NOTE: The noise source is a hot-cold body
 (AIL type 70 or equivalent) with a
 test receiver (AIL type 136 or equivalent).

Reference Designation	VALUE	
	100 MHz	400 MHz
C1	7.0 pF	1.8 pF
C2	1000 pF	17 pF
C3	3.0 pF	1.0 pF
C4	1–12 pF	0.8–8.0 pF
C5	1–12 pF	0.8–8.0 pF
C6	0.0015 μF	0.001 μF
C7	0.0015 μF	0.001 μF
L1	3.0 μH^*	0.2 μH^{**}
L2	0.15 μH^*	0.03 μH^{**}
L3	0.14 μH^*	0.022 μH^{**}

- *L1 17 turns, (approx. — depends upon circuit layout) AWG #28 enameled copper wire, close wound on 9/32" ceramic coil form. Tuning provided by a powdered iron slug.
- L2 4–1/2 turns, AWG #18 enameled copper wire, 5/16" long, 3/8" I.D. (AIR CORE).
- L3 3–1/2 turns, AWG #18 enameled copper wire, 1/4" long, 3/8" I.D. (AIR CORE).

- **L1 6 turns, (approx. — depends upon circuit layout) AWG #24 enameled copper wire, close wound on 7/32" ceramic coil form. Tuning provided by an aluminum slug.
- L2 1 turn, AWG #16 enameled copper wire, 3/8" I.D. (AIR CORE).
- L3 1/2 turn, AWG #16 enameled copper wire, 1/4" I.D. (AIR CORE).

Figure 2. 100 MHz and 400 MHz Neutralized Test Circuit

NOISE FIGURE

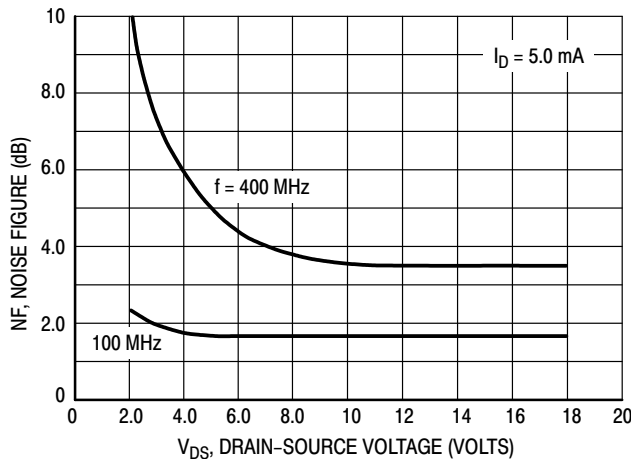
(T_{channel} = 25°C)

Figure 3. Effects of Drain-Source Voltage

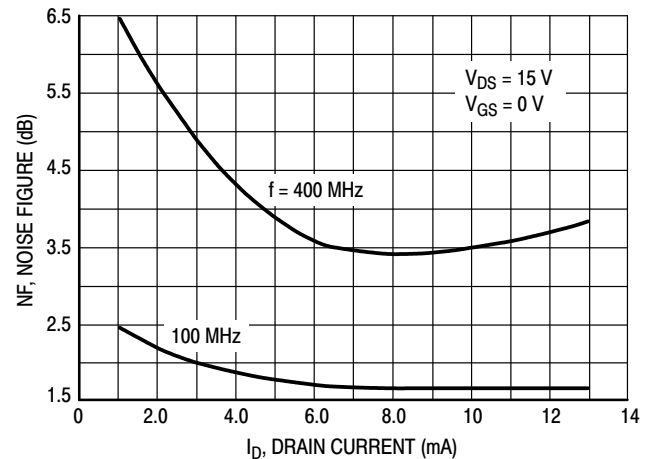


Figure 4. Effects of Drain Current

INTERMODULATION CHARACTERISTICS

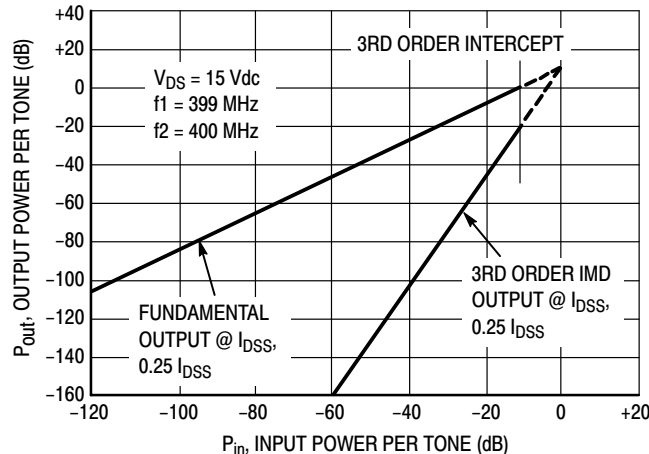


Figure 5. Third Order Intermodulation Distortion

COMMON SOURCE CHARACTERISTICS
ADMITTANCE PARAMETERS
 $(V_{DS} = 15 \text{ Vdc}, T_{\text{channel}} = 25^{\circ}\text{C})$

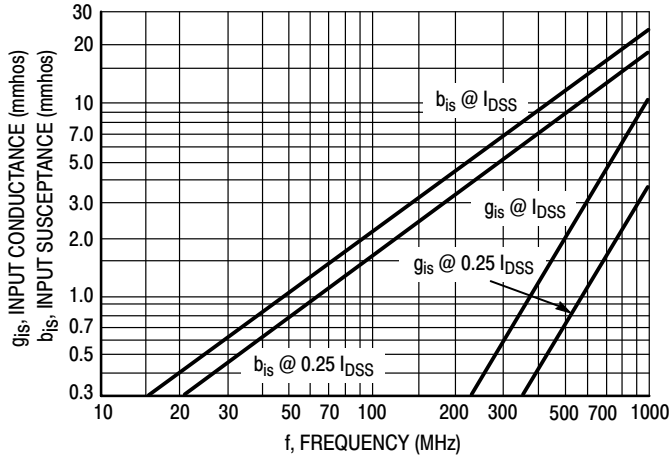


Figure 6. Input Admittance (y_{is})

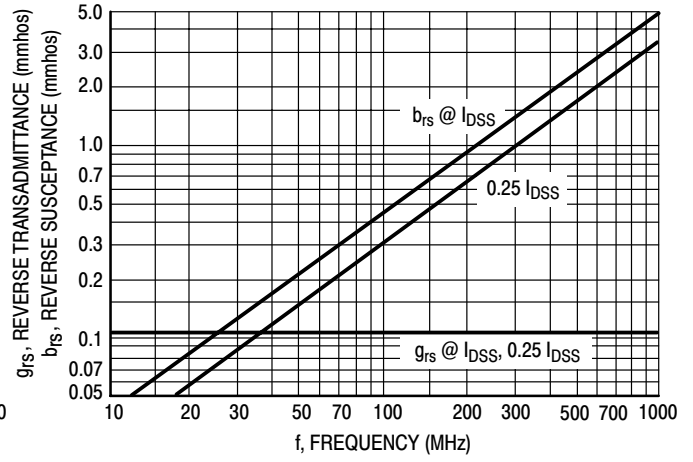


Figure 7. Reverse Transfer Admittance (y_{rs})

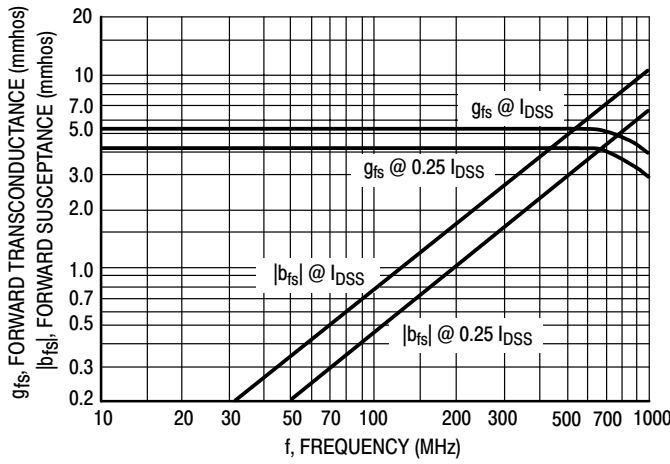


Figure 8. Forward Transadmittance (y_{fs})

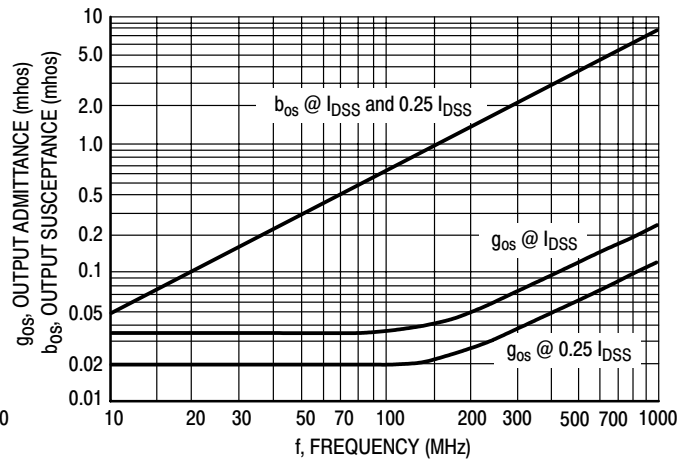


Figure 9. Output Admittance (y_{os})

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COMMON SOURCE CHARACTERISTICS S-PARAMETERS

($V_{DS} = 15$ Vdc, $T_{channel} = 25^{\circ}\text{C}$, Data Points in MHz)

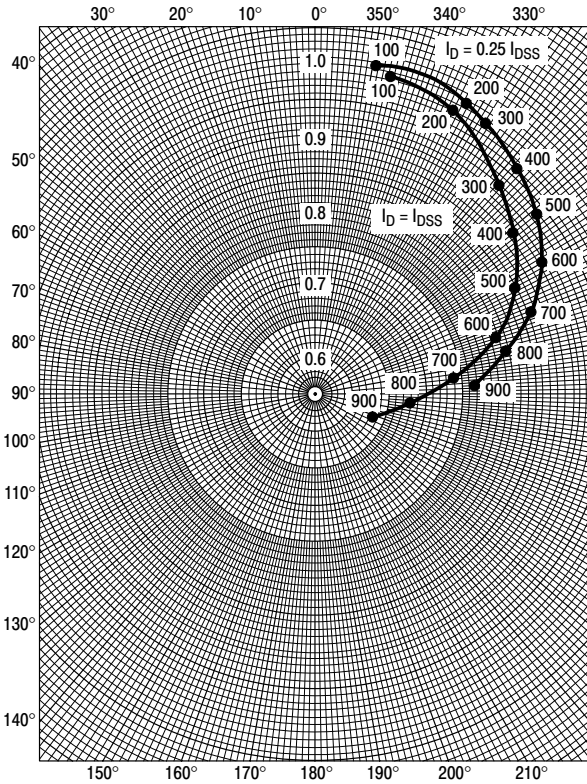


Figure 10. S_{11s}

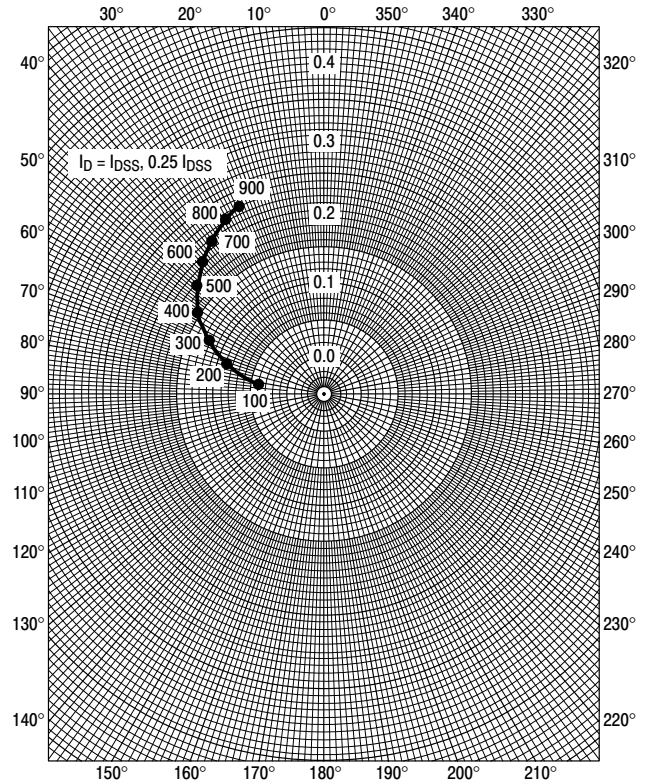
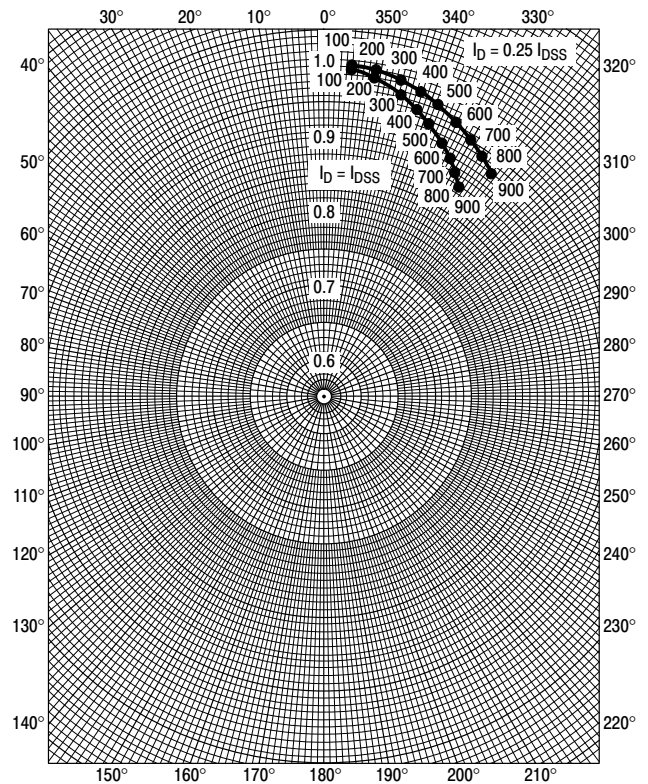
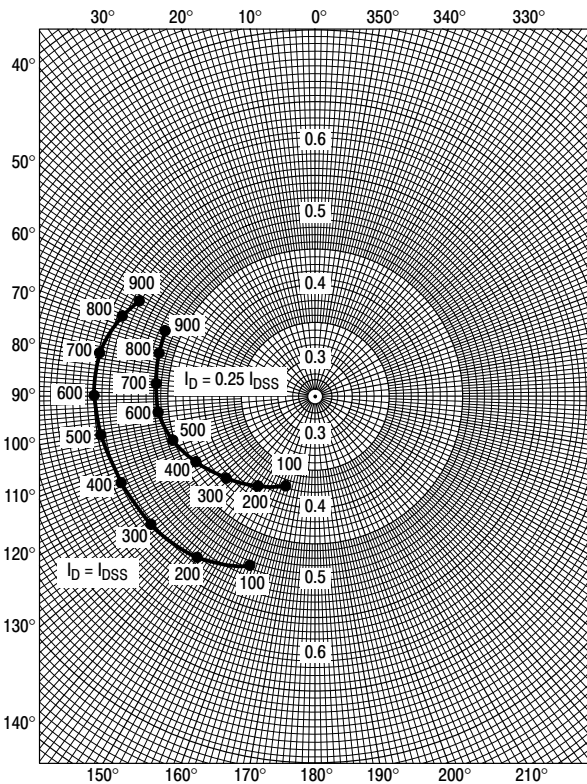


Figure 11. S_{12s}



COMMON GATE CHARACTERISTICS

ADMITTANCE PARAMETERS

($V_{DG} = 15 \text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$)

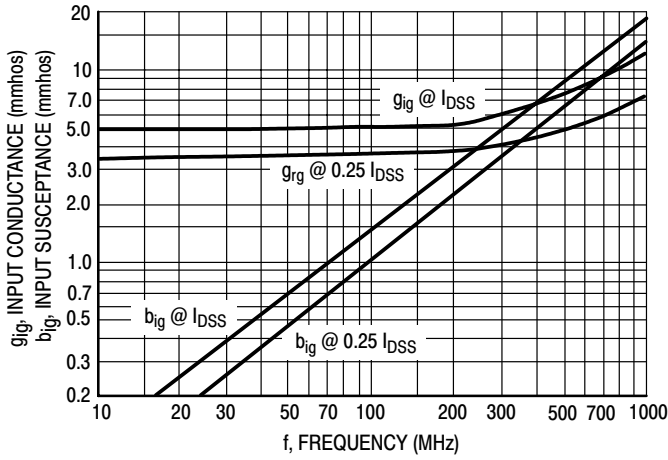


Figure 14. Input Admittance (y_{ig})

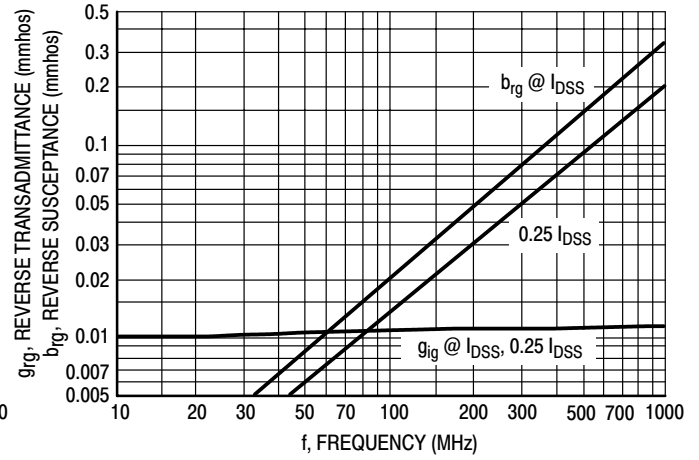


Figure 15. Reverse Transfer Admittance (y_{rg})

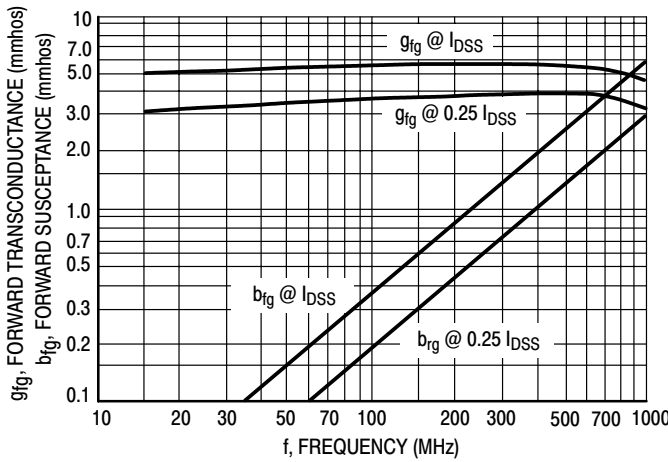


Figure 16. Forward Transfer Admittance (y_{fg})

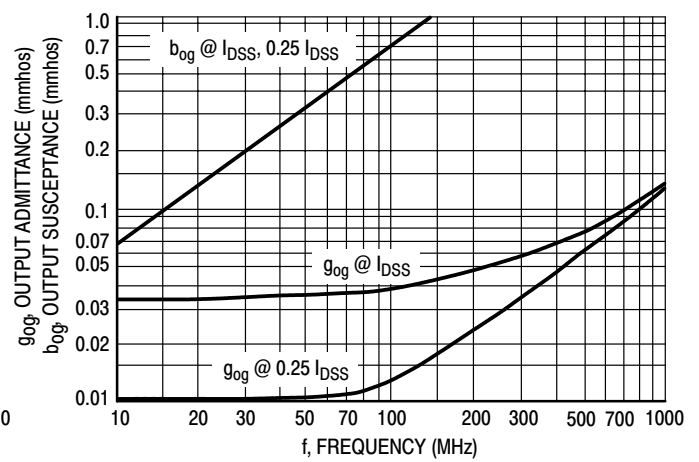


Figure 17. Output Admittance (y_{og})

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COMMON GATE CHARACTERISTICS S-PARAMETERS

($V_{DS} = 15 \text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$, Data Points in MHz)

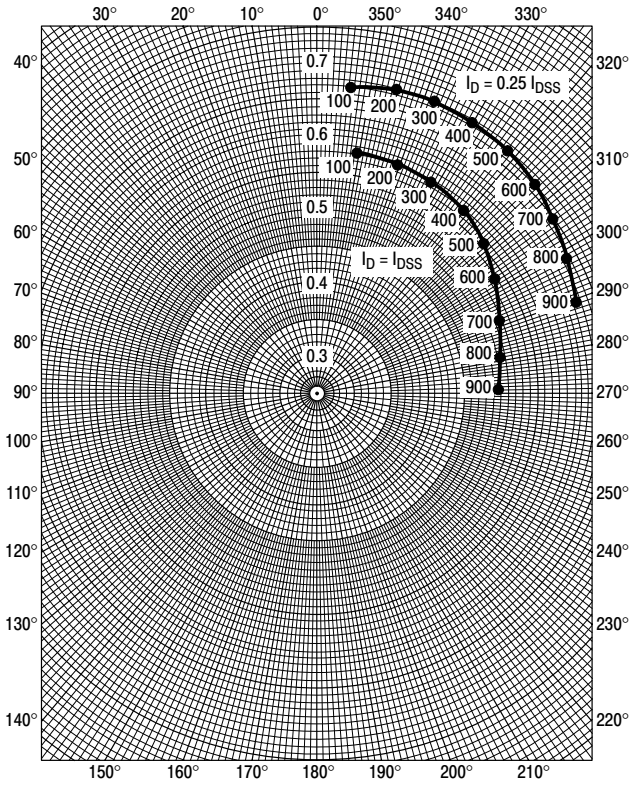


Figure 18. S_{11g}

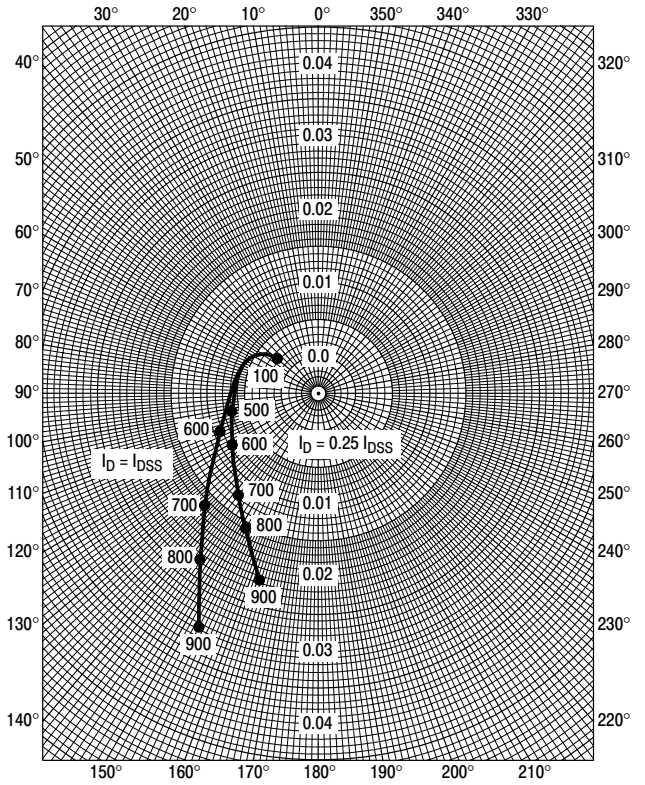
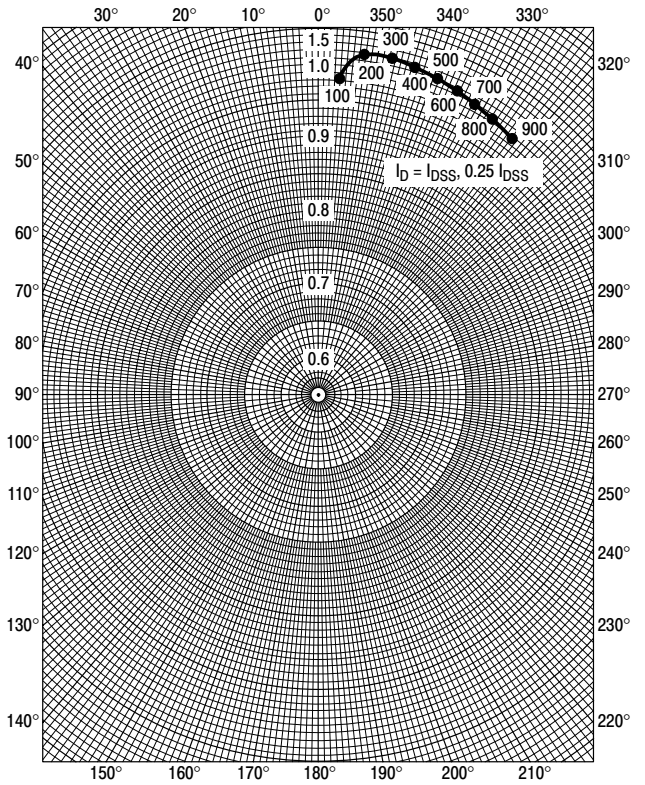
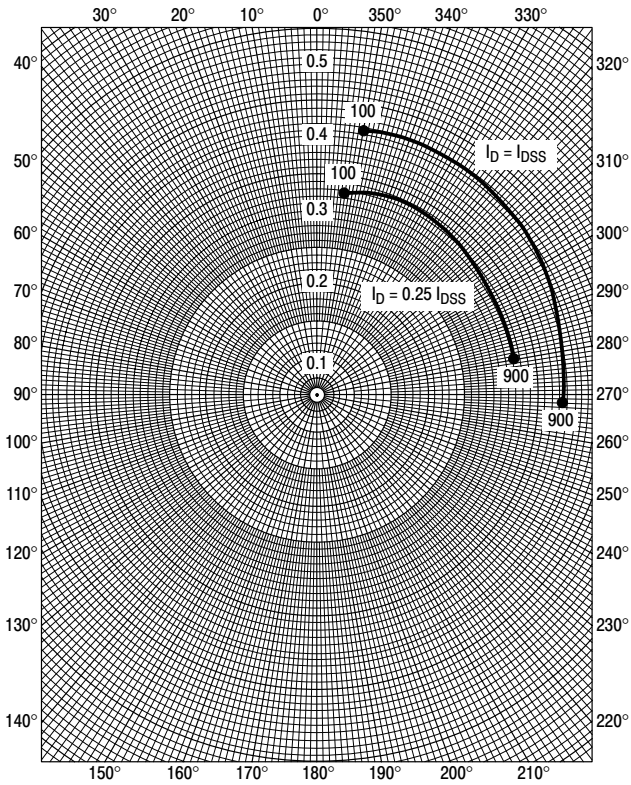


Figure 19. S_{12g}

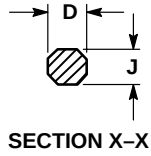
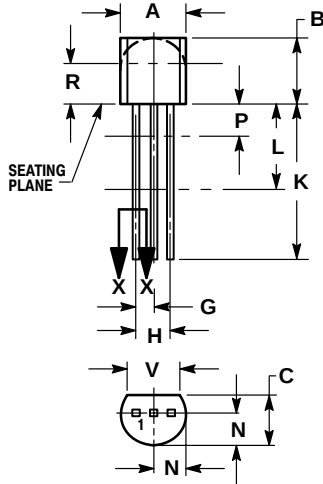


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PACKAGE DIMENSIONS

TO-92 (TO-226AA)
CASE 29-11
ISSUE AL



STYLE 5:
PIN 1. DRAIN
2. SOURCE
3. GATE

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

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