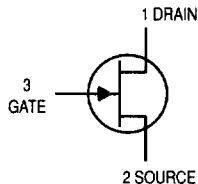


JFET VHF/UHF Amplifiers

N-Channel — Depletion



2N5484
2N5486



CASE 29-04, STYLE 5
TO-92 (TO-226AA)

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	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Gate-Source Breakdown Voltage ($I_G = -1.0 \mu\text{Adc}, V_{DS} = 0$)	$V_{(BR)GSS}$	-25	—	—	Vdc
Gate Reverse Current ($V_{GS} = -20 \text{ Vdc}, V_{DS} = 0$) ($V_{GS} = -20 \text{ Vdc}, V_{DS} = 0, T_A = 100^\circ\text{C}$)	I_{GSS}	— —	— —	-1.0 -0.2	nAdc μAdc
Gate Source Cutoff Voltage ($V_{DS} = 15 \text{ Vdc}, I_D = 10 \text{ nAdc}$)	$V_{GS(off)}$	-0.3 -2.0	— —	-3.0 -6.0	Vdc

ON CHARACTERISTICS

Zero- Gate- Voltage Drain Current ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0$)	I_{DSS}	1.0 8.0	— —	5.0 20	mAdc
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SMALL-SIGNAL CHARACTERISTICS

Forward Transfer Admittance ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ kHz}$)	$ y_{fs} $	3000 4000	— —	6000 8000	μmhos
Input Admittance ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 100 \text{ MHz}$) ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 400 \text{ MHz}$)	$\text{Re}(y_{is})$	— —	— —	100 1000	μmhos
Output Admittance ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ kHz}$)	$ y_{os} $	— —	— —	50 75	μmhos
Output Conductance ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 100 \text{ MHz}$) ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 400 \text{ MHz}$)	$\text{Re}(y_{os})$	— —	— —	75 100	μmhos
Forward Transconductance ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 100 \text{ MHz}$) ($V_{DS} = 15 \text{ Vdc}, V_{GS} = 0, f = 400 \text{ MHz}$)	$\text{Re}(y_{fs})$	2500 3500	— —	— —	μmhos

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
SMALL-SIGNAL CHARACTERISTICS (continued)					
Input Capacitance ($V_{DS} = 15\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{iss}	—	—	5.0	pF
Reverse Transfer Capacitance ($V_{DS} = 15\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{rss}	—	—	1.0	pF
Output Capacitance ($V_{DS} = 15\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{oss}	—	—	2.0	pF

FUNCTIONAL CHARACTERISTICS

Noise Figure ($V_{DS} = 15\text{ Vdc}$, $V_{GS} = 0$, $R_G = 1.0\text{ Megohm}$, $f = 1.0\text{ kHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 1.0\text{ mAdc}$, $R_G = 1.0\text{ k}\Omega$, $f = 100\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 1.0\text{ mAdc}$, $R_G = 1.0\text{ k}\Omega$, $f = 200\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 4.0\text{ mAdc}$, $R_G = 1.0\text{ k}\Omega$, $f = 100\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 4.0\text{ mAdc}$, $R_G = 1.0\text{ k}\Omega$, $f = 400\text{ MHz}$)	NF	—	—	2.5	dB
Common Source Power Gain ($V_{DS} = 15\text{ Vdc}$, $I_D = 1.0\text{ mAdc}$, $f = 100\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 1.0\text{ mAdc}$, $f = 200\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 4.0\text{ mAdc}$, $f = 100\text{ MHz}$) ($V_{DS} = 15\text{ Vdc}$, $I_D = 4.0\text{ mAdc}$, $f = 400\text{ MHz}$)	G_{ps}	16	—	25	dB
		—	14	—	
		18	—	30	
		10	—	20	

POWER GAIN

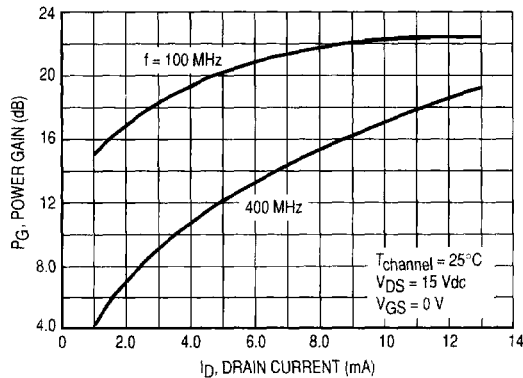
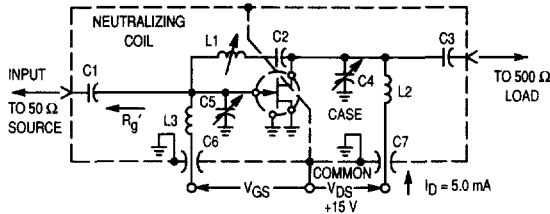


Figure 1. Effects of Drain Current



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
 ($T_{\text{channel}} = 25^\circ\text{C}$)

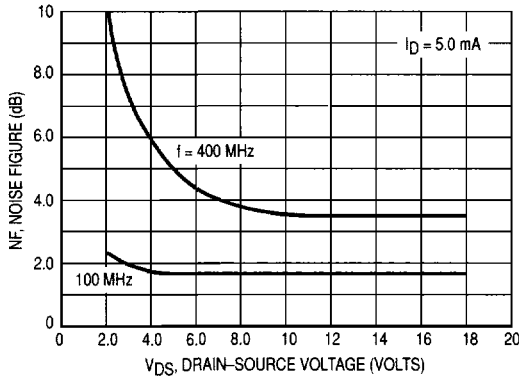


Figure 3. Effects of Drain-Source Voltage

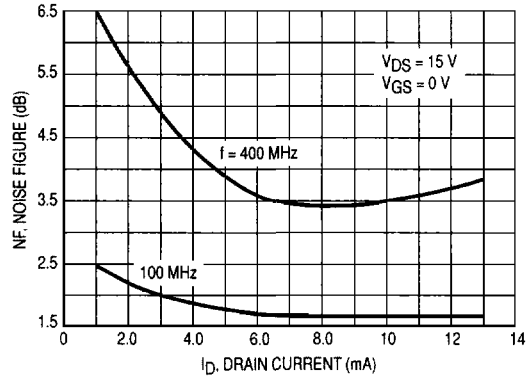


Figure 4. Effects of Drain Current

INTERMODULATION CHARACTERISTICS

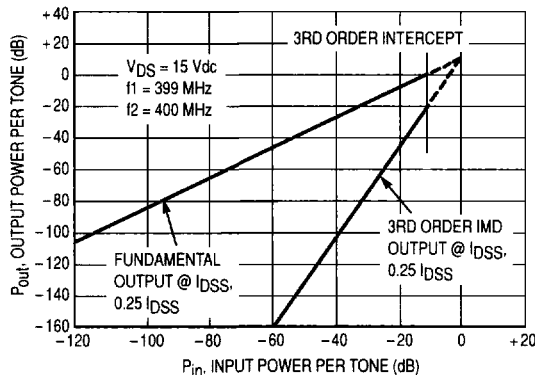


Figure 5. Third Order Intermodulation Distortion

COMMON SOURCE CHARACTERISTICS
ADMITTANCE PARAMETERS
 (VDS = 15 Vdc, Tchannel = 25°C)

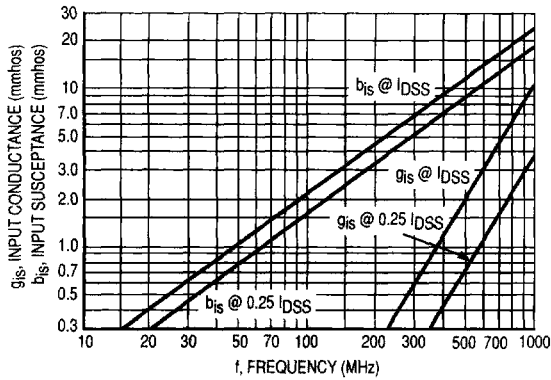


Figure 6. Input Admittance (y_{is})

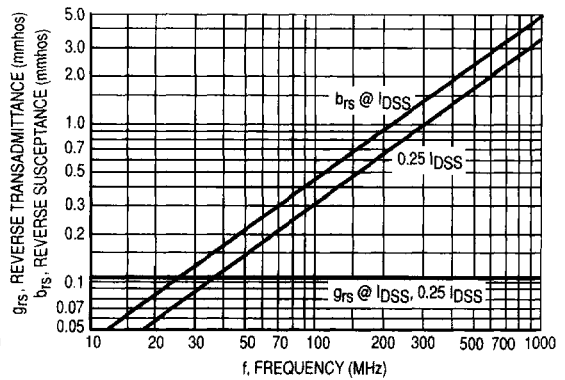


Figure 7. Reverse Transfer Admittance (y_{rs})

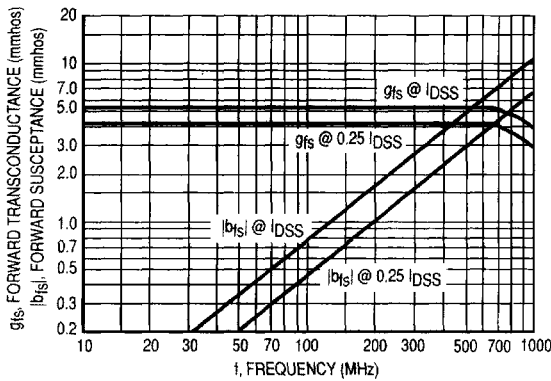


Figure 8. Forward Transadmittance (y_{fs})

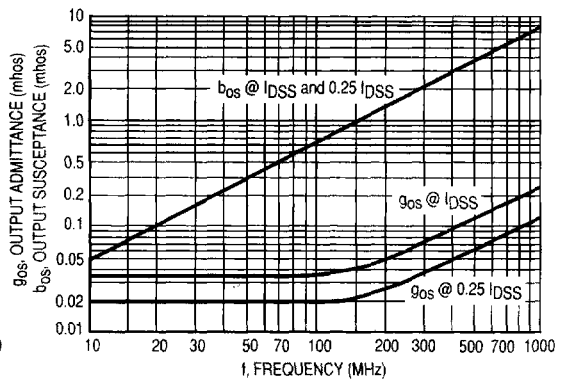


Figure 9. Output Admittance (y_{os})

COMMON SOURCE CHARACTERISTICS
S-PARAMETERS

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

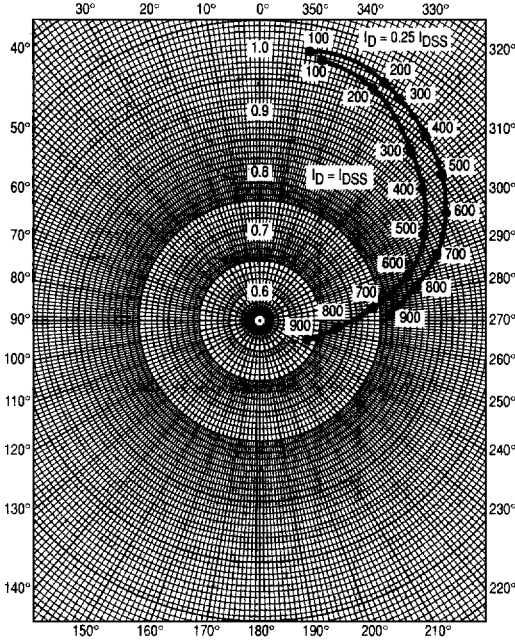


Figure 10. S_{11s}

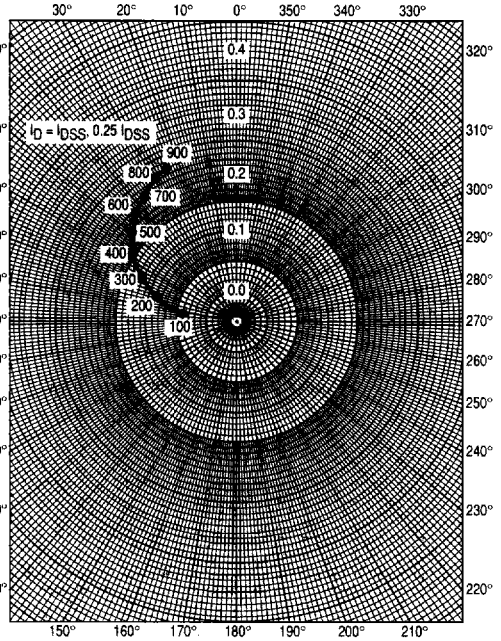


Figure 11. S_{12s}

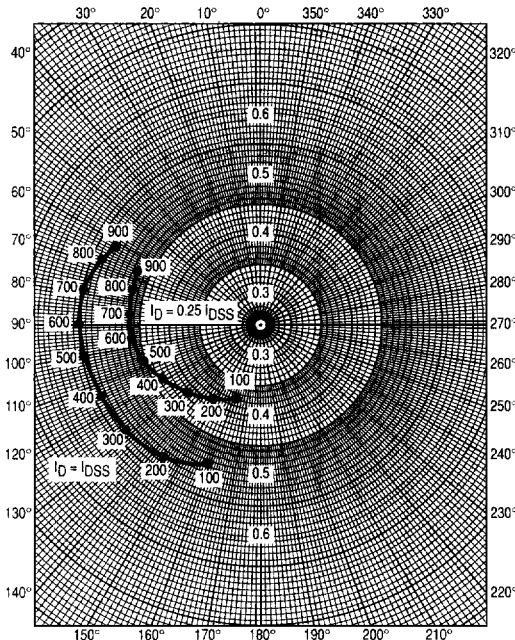


Figure 12. S_{21s}

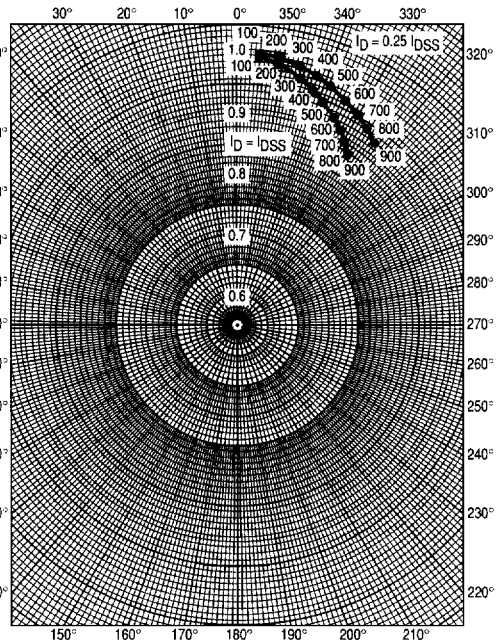


Figure 13. S_{22s}

COMMON GATE CHARACTERISTICS
ADMITTANCE PARAMETERS
 (V_{DG} = 15 Vdc, T_{channel} = 25°C)

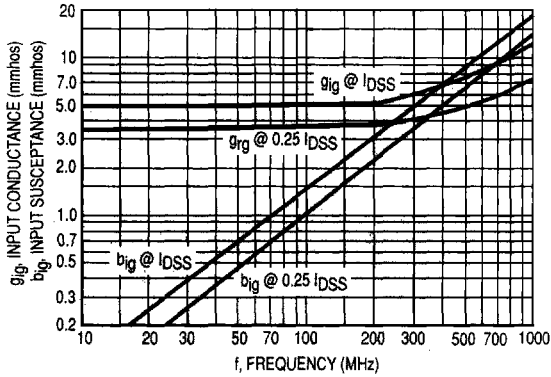


Figure 14. Input Admittance (y_{ig})

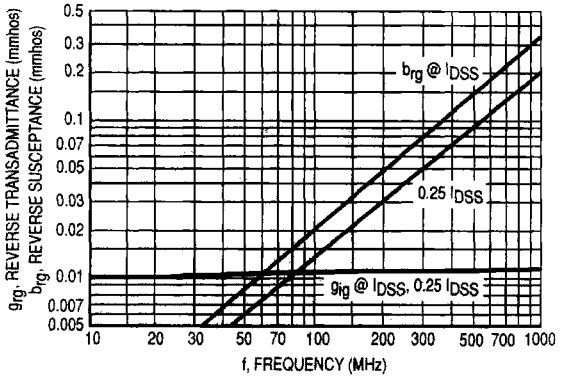


Figure 15. Reverse Transfer Admittance (y_{rg})

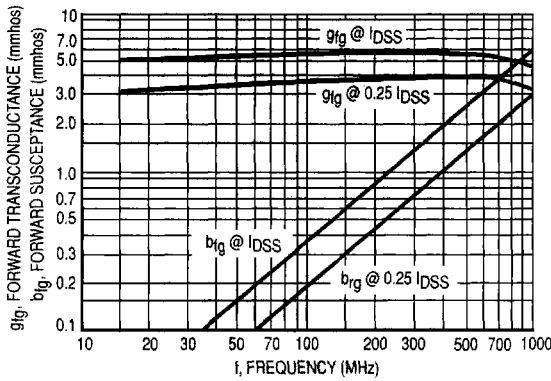


Figure 16. Forward Transfer Admittance (y_{fg})



Figure 17. Output Admittance (y_{og})

COMMON GATE CHARACTERISTICS
S-PARAMETERS
 ($V_{DS} = 15 \text{ Vdc}$, $T_{\text{channel}} = 25^\circ\text{C}$, Data Points in MHz)

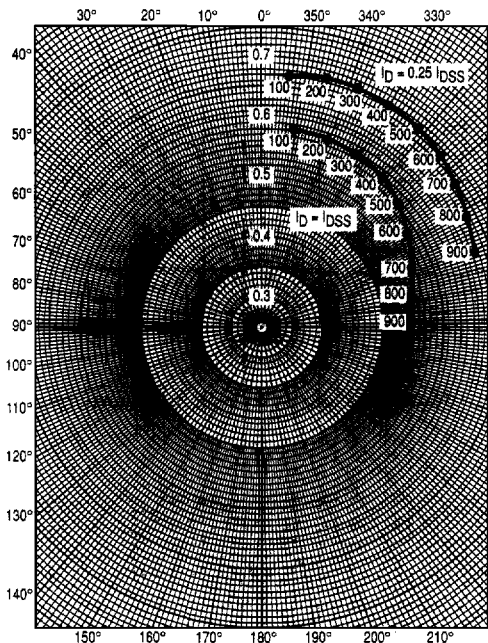


Figure 18. S_{11g}

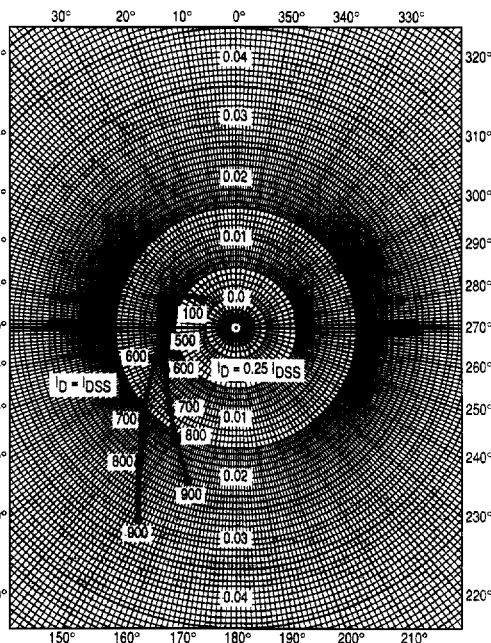


Figure 19. S_{12g}

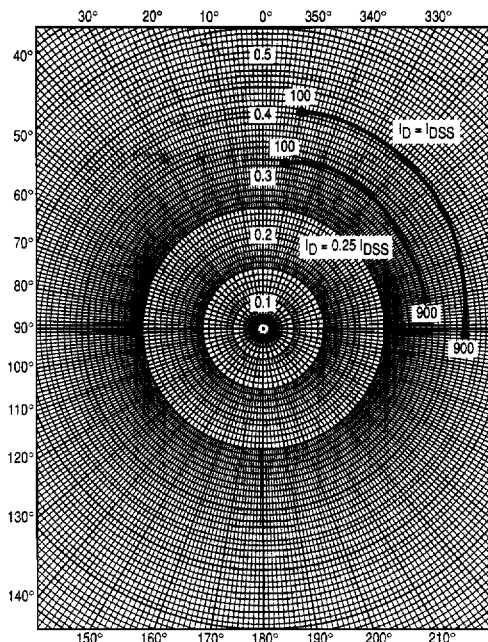


Figure 20. S_{21g}

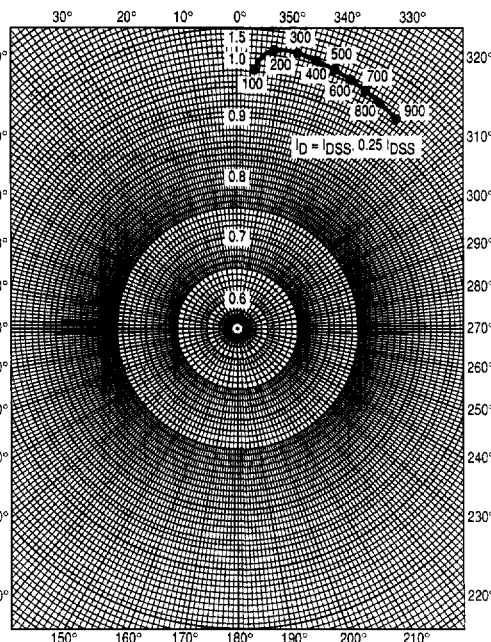


Figure 21. S_{22g}