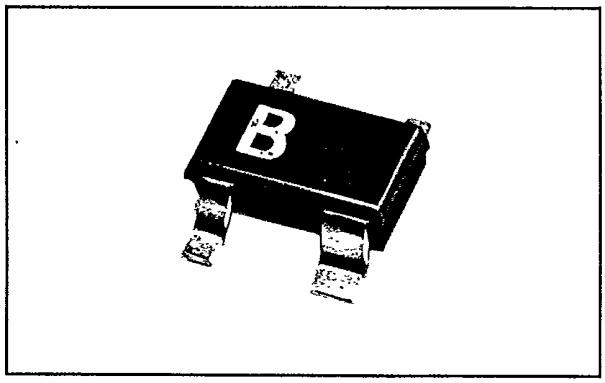
SONY **3SK148**

GaAs N-channel Dual-Gate MES FET

Description:

The 3SK148 is a GaAs N-channel Dual-Gate MES FET for low noise UHF amplifiers and mixers. Low noise and high gain characteristics are accomplished by optimum mask pattern designing. Easier high frequency circuits adjustments are made possible by the miniaturized plastic molded package which contributes to reduce parasitic elements of the device.



Features:

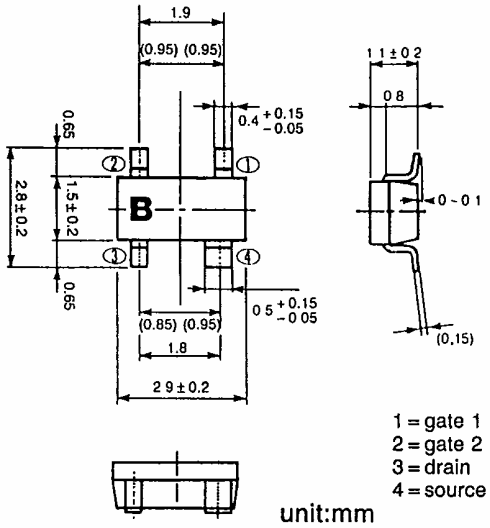
Low NF: NF = 1.2 dB (typ.) at 800MHz
High PG: PG = 20 dB (typ.) at 800MHz
High Stability

Applications:

- UHF Amplifier, mixer, oscillator

Absolute Maximum Ratings: (Ta = 25°C)

• Drain to Source Voltage:	Vdsx	8	V
• Gate 1 to Source Voltage:	Vg1s	−6	V
• Gate 2 to Source Voltage:	Vg2s	−6	V
• Drain Current:	Id	80	mA
• Power Dissipation:	Pch	150	mW
• Channel Temperature:	Tch	+150	°C
• Storage Temperature:	Tstg	−55 ~ +150	°C

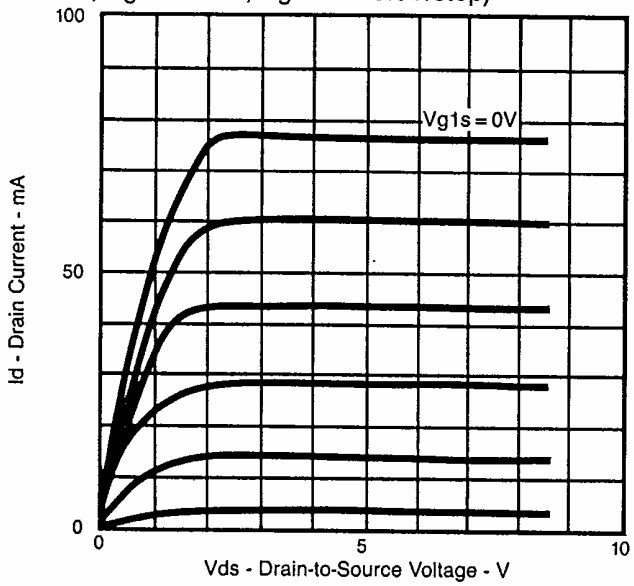


Electrical Characteristics: (Ta = 25°C)

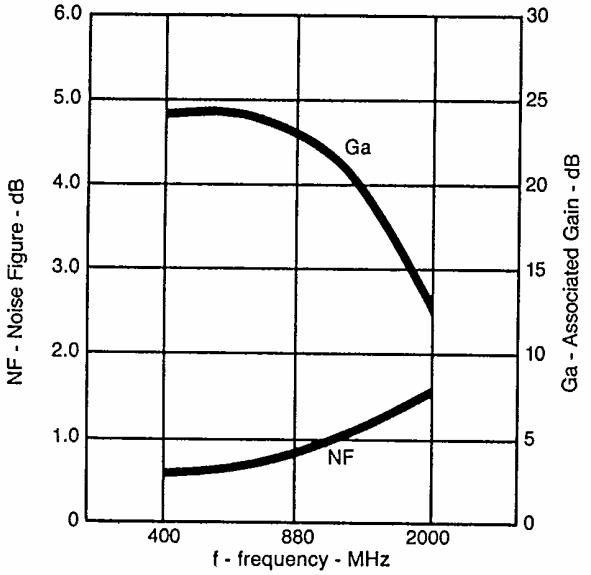
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain to Source Voltage	Vdsx	Id = 100μA Vg1s = 8 Vg2s = −5V	8			V
Gate 1 Cutoff Current	Ig1ss	Vg1s = −4V Vg2s = 0V Vds = 0V	−10			μA
Gate 2 Cuttoff Current	Ig2ss	Vg2s = −4V Vg1s = 0V Vds = 0V	−10			μA
Drain Saturation Current	Idss	Vds = 5V Vg1s = 0V Vg2s = 0V	30		80	mA
Gate 1 Pinchoff Voltage	Vp1	Vds = 5V Id = 100μA Vg2s = 0V	−4		−1	V
Gate 2 Pinchoff Voltage	Vp2	Vds = 5V Id = 100μA Vg1s = 0V	−4		−1	V
Transconductance	gm	Vds = 5V Id = 10mA Vg2s = 1.5V f = 1KHz	15	22		mS
Input Capacitance	Ciss	Vds = 5V Id = 10mA Vg2s = 1.5V f = 1MHz		0.5	1.0	PF
Feedback Capacitance	Crss			7.5	25	fF
Power Gain	PG	Vds = 5V Id = 10mA Vg2s = 1.5V f = 800MHz	16	20		dB
Noise Figure	NF			1.2	2.0	dB

The specifications are subject to change without notice.

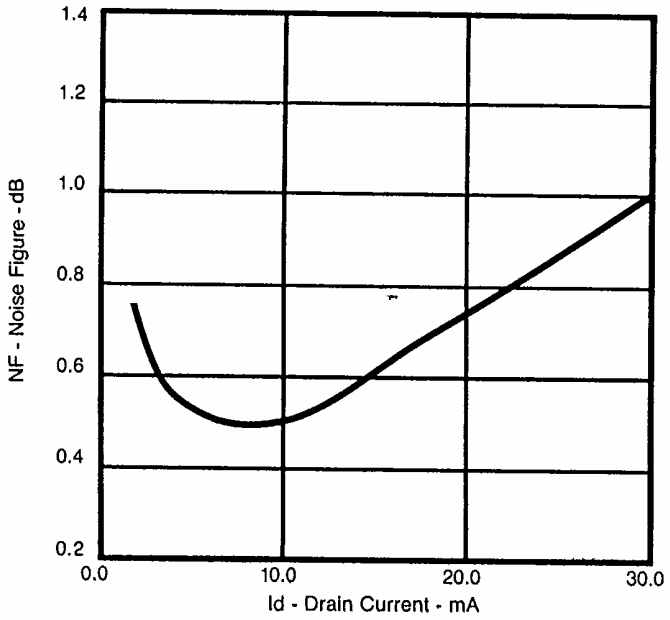
Output Characteristics: (Ta = 25°C, Vg2s = 1.5V, Vg1s = −0.5V/step)



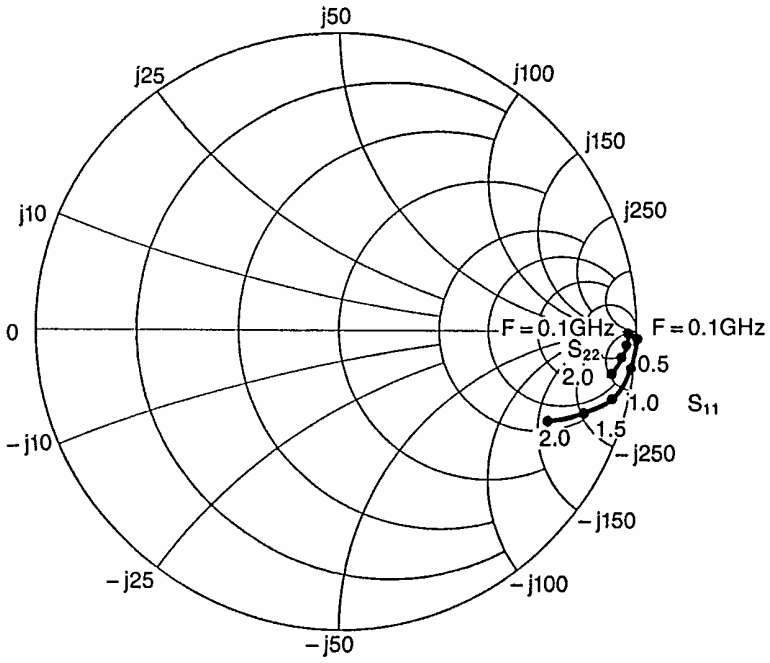
NF, Ga Frequency Dependence: (Vds = 5.0V, Vg2s = 1.5V, Ids = 10mA)

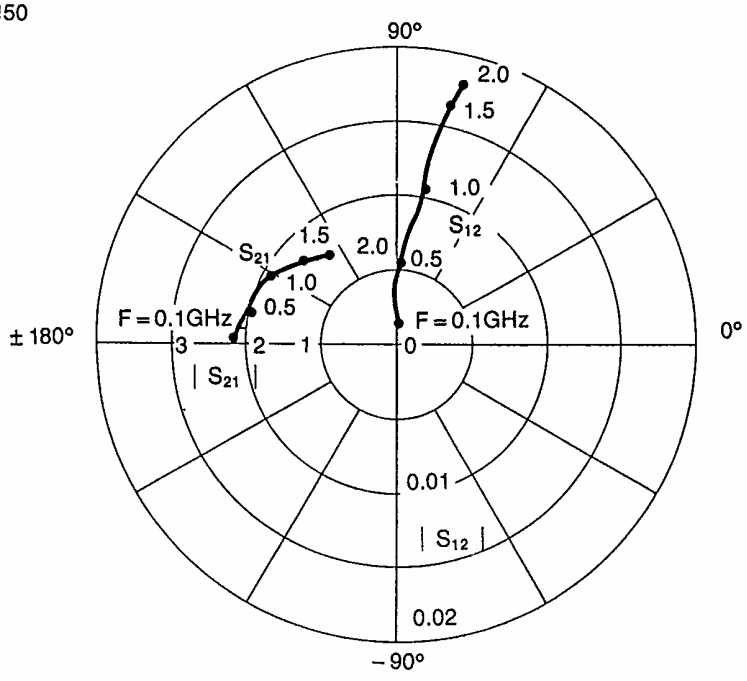


NF-Id Characteristics: (Vds = 5.0V, Vg2s = 1.5V, Frequency at 450MHz)



S-Parameters vs. Frequency Characteristics: (Vds = 5.0V, Vg2s = 1.5V, Ids = 10mA)



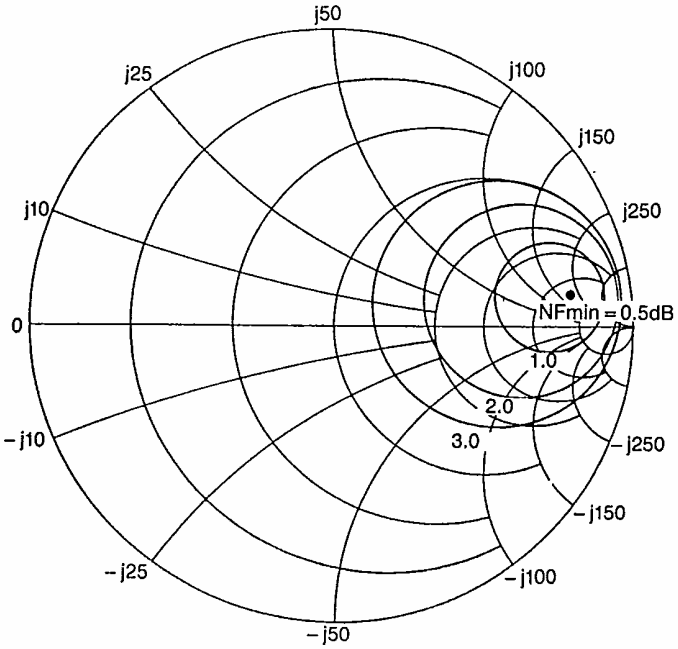


S-Parameter Data of FET 3SK148 (50.0 Ohm reference)

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	.999	-1.60	2.065	177.40	0.0011	88.48	.961	-.77
200	.998	-2.97	2.044	172.69	0.0021	93.67	.961	-1.85
300	.999	-4.28	2.180	169.86	0.0023	105.04	.971	-2.98
400	.993	-5.70	2.077	170.12	0.0049	89.67	.958	-3.51
500	.989	-6.98	1.981	167.14	0.0054	83.41	.958	-4.17
600	.979	-8.16	1.999	161.04	0.0068	83.94	.960	-5.09
700	.969	-9.57	2.004	160.63	0.0082	83.47	.955	-5.68
800	.958	-10.84	1.957	159.23	0.0084	82.97	.955	-6.83
900	.948	-12.16	1.856	153.88	0.0091	79.56	.948	-7.22
1000	.938	-13.23	1.938	150.58	0.0106	78.17	.949	-8.58
1200	.912	-15.27	1.789	147.43	0.0131	79.92	.941	-10.37
1400	.877	-17.11	1.823	139.04	0.0151	74.26	.936	-12.06
1600	.841	-19.12	1.700	137.04	0.0156	78.12	.935	-13.26
1800	.805	-21.04	1.704	132.09	0.0171	77.47	.928	-13.91
2000	.756	-22.32	1.448	126.14	0.0176	76.07	.922	-14.46

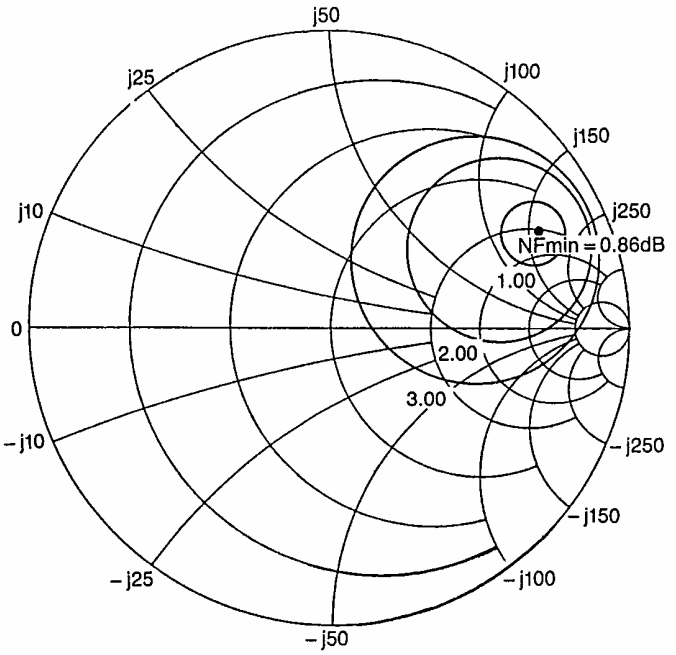
Noise Figure Characteristics: (Vds = 5.0V, Vg2s = 1.5V, Ids = 10mA)

at 450MHz



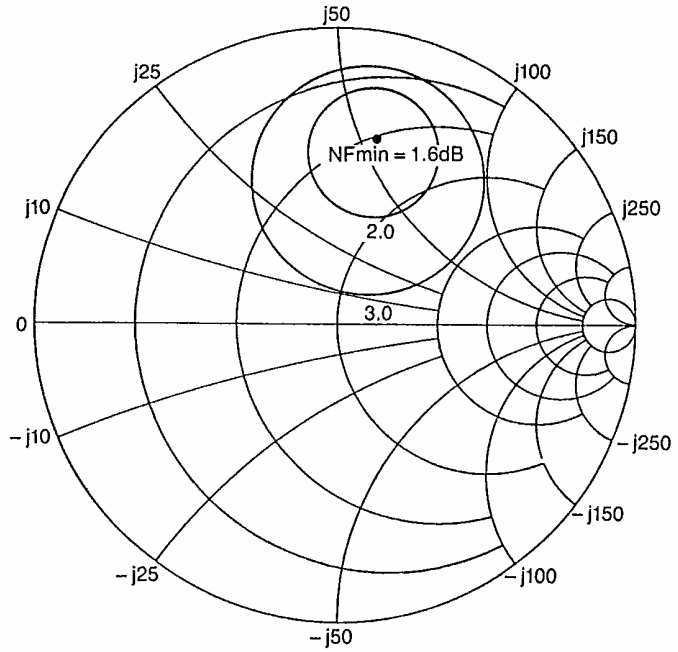
Vds = 5.0V
Vg2s = 1.5V
Ids = 10mA
Frequency 450 MHz
NF min 0.50 dB
Ga 23.83 dB
Gamma (S); Mag 0.799 Ang 7.78°
Gamma (L); Mag 0.887 Ang 7.31°

at 880MHz



Vds = 5.0V
Vg2s = 1.5V
Ids = 10mA
Frequency 880 MHz
NF min 0.86 dB
Ga 23.70 dB
Gamma (S); Mag 0.771, Ang 25.07°
Gamma (L); Mag 0.830, Ang 21.84°

at 2000MHz



Frequency (MHz)	Ga (dB)	NF (dB)	Gamma- S		Gamma- L	
			(Mag.)	(Ang.)	(Mag.)	(Ang.)
400	23.54	0.59	0.824	3.16°	0.910	8.75°
450	23.83	0.50	0.799	7.78°	0.887	7.31°
500	22.79	0.47	0.792	12.03°	0.848	14.56°
880	23.70	0.86	0.771	25.07°	0.830	21.84°
2000	12.92	1.60	0.643	78,48°	0.559	46.00°

Vds = 5.0V
Vg2s = 1.5V
Ids = 10mA
Frequency 2000 MHz
NF min 1.60 dB
Ga 12.91 dB
Gamma (S); Mag 0.643, Ang 78.48°
Gamma (L); Mag 0.559, Ang 46.00°

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Printed in U.S.A.
7-85-1.7M