

Preliminary

MITSUBISHI SEMICONDUCTOR<GaAs FET>

MGF0913A

L & S BAND GaAs FET [SMD non - matched]

DESCRIPTION

The MGF0913A GaAs FET with an N-channel schottky Gate, is designed for use UHF band amplifiers.

FEATURES

- High output power
 $P_o=31\text{dBm(TYP.)}$ @ $f=1.9\text{GHz}$, $P_{in}=18\text{dBm}$
- High power gain
 $G_p=13\text{dB(TYP.)}$ @ $f=1.9\text{GHz}$
- High power added efficiency
 $\eta_{add}=48\%(\text{TYP.})$ @ $f=1.9\text{GHz}$, $P_{in}=18\text{dBm}$
- Hermetic Package

APPLICATION

- For UHF Band power amplifiers

QUALITY

- GG

RECOMMENDED BIAS CONDITIONS

- $V_{ds}=10\text{V}$ • $I_{ds}=200\text{mA}$ • $R_g=500\Omega$

Delivery Tape & Reel

Absolute maximum ratings (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGSO	Gate to source breakdown voltage	-15	V
VGDO	Gate to drain breakdown voltage	-15	V
ID	Drain current	800	mA
IGR	Reverse gate current	-2.5	mA
IGF	Forward gate current	5.4	mA
PT	Total power dissipation	5.0	W
Tch	Cannel temperature	175	°C
Tstg	Storage temperature	-65 to +175	°C

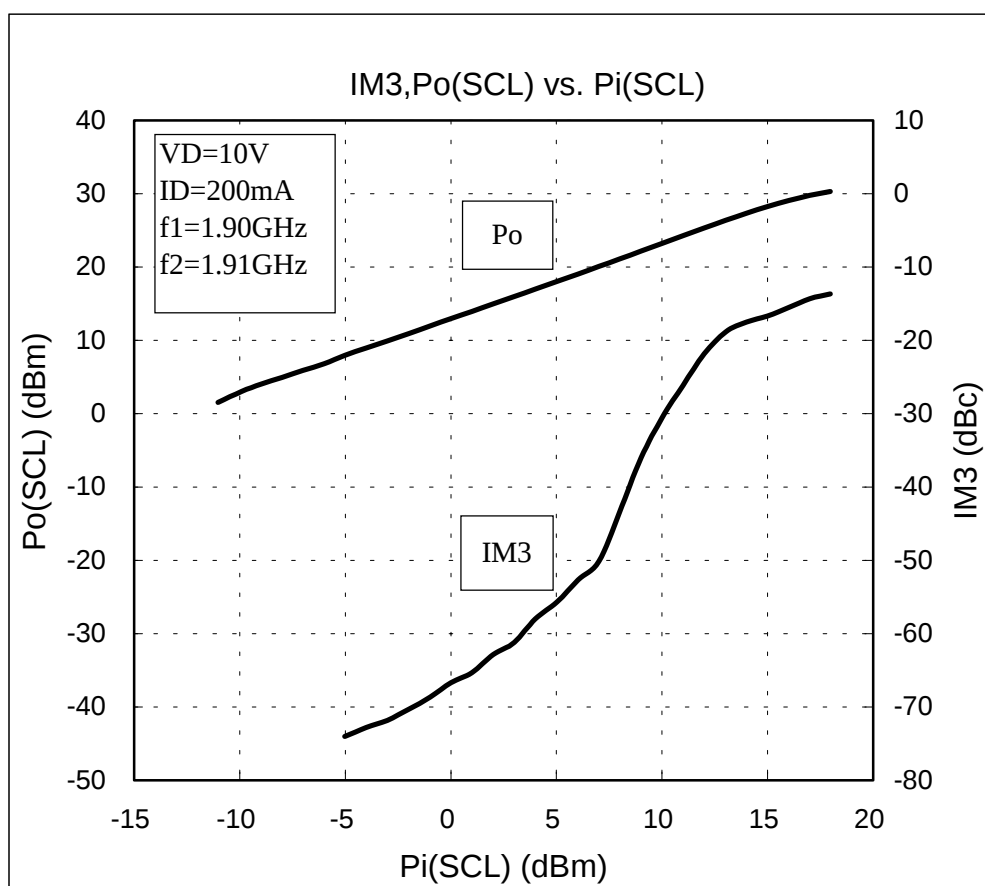
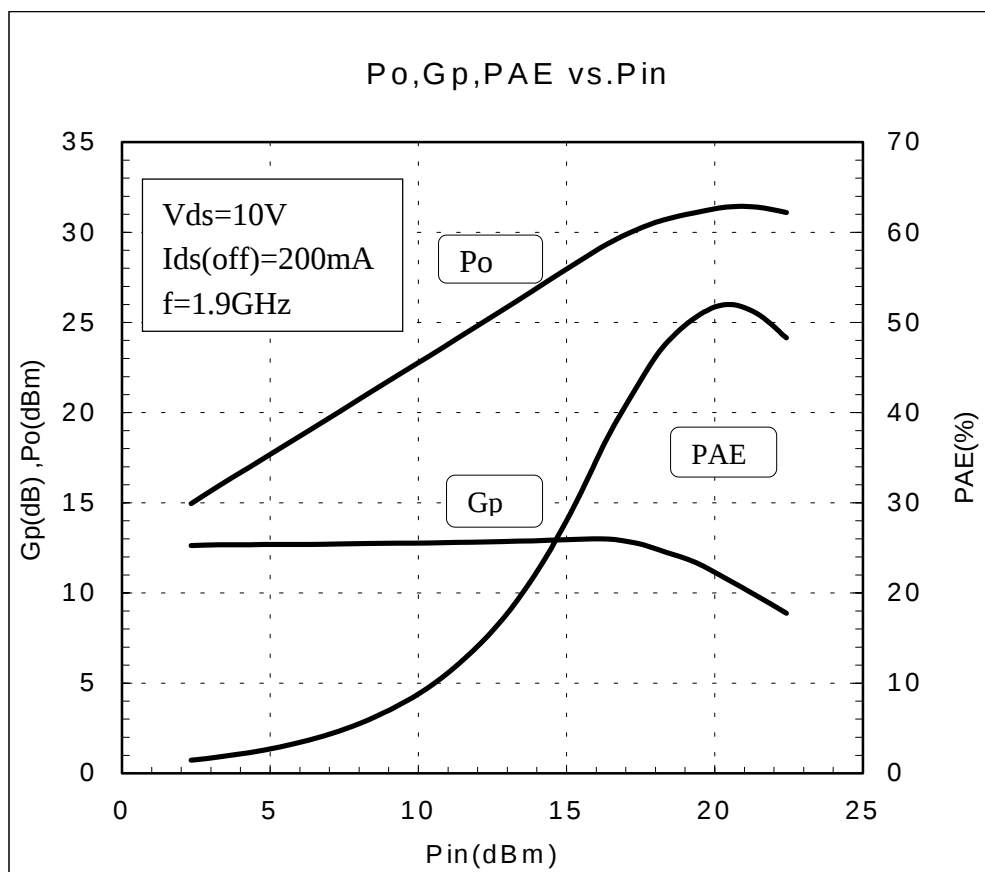
Fig.1

Electrical characteristics (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDSS	Saturated drain current	$V_{DS}=3\text{V}, V_{GS}=0\text{V}$	400	550	800	mA
VGS(off)	Gate to source cut-off voltage	$V_{DS}=3\text{V}, I_D=2.5\text{mA}$	-1	-3	-5	V
gm	Transconductance	$V_{DS}=3\text{V}, I_D=300\text{mA}$	-	200	-	mS
Po	Output power	$V_{DS}=10\text{V}, I_D=200\text{mA}, f=1.9\text{GHz}$	29.5	31	-	dBm
η_{add}	Power added Efficiency		-	48	-	%
GLP	Linear Power Gain		-	13	-	dB
NF	Noise figure	$V_{DS}=10\text{V}, I_D=200\text{mA}, f=1.9\text{GHz}$	-	2.0	-	dB
Rth(ch-c)	Thermal Resistance *1	ΔV_f Method	-	20	30	°C/W

*1: Channel to case / Above parameters, ratings, limits are subject to change.

MGF0913A TYPICAL CHARACTERISTICS



MGF0913A S PARAMETERS (Ta=25°C,VD=10V,ID=200mA, Reference Plane see Fig.1)

freq.	S11		S21		S12		S22		K	MSG/MAG
(GHz)	Mag	Ang(deg)	Mag	Ang(deg)	Mag	Ang(deg)	Mag	Ang(deg)		(dB)
0.4	0.876	-73.47	8.438	128.66	0.035	52.26	0.187	-88.62	0.37	23.86
0.6	0.840	-97.92	7.023	114.45	0.036	45.45	0.207	-100.26	0.50	22.85
0.8	0.812	-115.67	5.895	102.22	0.038	40.22	0.228	-108.41	0.64	21.87
1.0	0.789	-128.85	5.000	91.60	0.041	36.20	0.246	-113.91	0.77	20.84
1.2	0.770	-139.02	4.296	82.38	0.043	33.18	0.265	-117.47	0.91	19.99
1.4	0.755	-147.10	3.744	74.14	0.046	30.94	0.283	-119.66	1.03	18.13
1.6	0.743	-153.90	3.314	66.68	0.048	29.18	0.301	-120.99	1.14	16.10
1.8	0.732	-159.90	2.981	59.82	0.051	27.72	0.320	-121.71	1.22	14.85
2.0	0.721	-165.32	2.725	53.35	0.054	26.45	0.338	-122.10	1.28	13.85
2.2	0.710	-170.35	2.525	47.27	0.057	25.17	0.357	-122.43	1.33	13.05
2.4	0.699	-174.98	2.368	41.17	0.060	23.87	0.376	-122.87	1.36	12.40
2.6	0.687	-179.13	2.242	35.27	0.064	22.37	0.395	-123.49	1.36	11.88
2.8	0.673	-177.13	2.135	29.35	0.066	20.75	0.413	-124.39	1.39	11.34
3.0	0.657	-173.81	2.043	23.33	0.071	18.73	0.432	-125.60	1.38	10.91
3.2	0.638	-170.10	1.961	17.19	0.075	16.49	0.450	-127.10	1.39	10.43
3.4	0.617	-165.88	1.886	11.05	0.080	13.95	0.466	-129.00	1.39	9.98
3.6	0.593	-161.47	1.816	4.68	0.085	11.08	0.484	-131.10	1.40	9.50
3.8	0.566	-157.06	1.748	-1.71	0.091	7.89	0.499	-133.42	1.41	9.03
4.0	0.536	-152.35	1.686	-8.33	0.098	4.37	0.515	-135.94	1.42	8.54
4.2	0.503	-147.56	1.629	-14.97	0.105	0.53	0.529	-138.55	1.42	8.07
4.4	0.468	-142.21	1.579	-21.76	0.112	-3.56	0.541	-141.24	1.43	7.61
4.6	0.430	-136.15	1.536	-28.70	0.120	-8.00	0.552	-143.89	1.42	7.21
4.8	0.390	-129.19	1.504	-35.69	0.129	-12.69	0.562	-146.56	1.40	6.89
5.0	0.349	-120.74	1.483	-42.75	0.138	-17.65	0.569	-149.09	1.39	6.61
5.2	0.308	-110.58	1.472	-49.88	0.148	-22.88	0.574	-151.67	1.35	6.44
5.4	0.269	-98.02	1.472	-57.08	0.158	-28.38	0.576	-154.13	1.31	6.34
5.6	0.235	-82.39	1.478	-64.44	0.168	-34.04	0.575	-156.56	1.27	6.30
5.8	0.212	-63.23	1.489	-71.95	0.179	-40.05	0.570	-159.07	1.23	6.32
6.0	0.203	-41.41	1.497	-79.70	0.190	-46.20	0.559	-161.78	1.19	6.34
6.2	0.215	-19.59	1.499	-87.59	0.200	-52.79	0.542	-164.81	1.16	6.33
6.4	0.243	0.50	1.480	-95.81	0.211	-59.61	0.516	-168.19	1.14	6.21
6.6	0.286	-14.85	1.434	-104.58	0.223	-66.98	0.483	-172.11	1.13	5.90
6.8	0.343	-26.80	1.343	-114.05	0.233	-74.95	0.438	-176.62	1.15	5.25
7.0	0.411	-35.64	1.190	-124.27	0.244	-83.67	0.382	-178.34	1.21	4.10

