

Preliminary

MITSUBISHI SEMICONDUCTOR<GaAs FET>

MGF0914A

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

DESCRIPTION

The MGF0914A GaAs FET with an N-channel schottky Gate, is designed for use UHF band amplifiers.

FEATURES

- High output power
 $P_o=35.5\text{dBm(TYP.)}$ @ $f=1.9\text{GHz}$, $P_{in}=26\text{dBm}$
- High power gain
 $G_p=11\text{dB(TYP.)}$ @ $f=1.9\text{GHz}$
- High power added efficiency
 $\eta_{add}=48\%(\text{TYP.})$ @ $f=1.9\text{GHz}$, $P_{in}=26\text{dBm}$
- Hermetic Package

APPLICATION

- For UHF Band power amplifiers

QUALITY

- GG

RECOMMENDED BIAS CONDITIONS

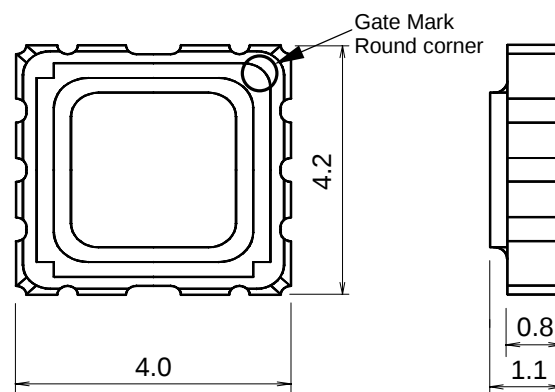
- $V_{ds}=10\text{V}$
- $I_{ds}=800\text{mA}$
- $R_g=100\Omega$

Absolute maximum ratings

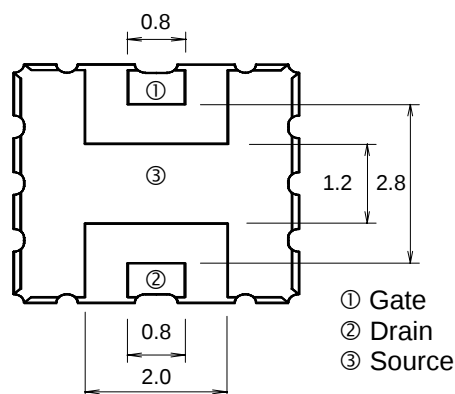
Symbol	Parameter	Ratings	Unit
VGSO	Gate to source breakdown voltage	-15	V
VGDO	Gate to drain breakdown voltage	-15	V
ID	Drain current	3200	mA
IGR	Reverse gate current	-10	mA
IGF	Forward gate current	21.5	mA
PT	Total power dissipation	12	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	-65 to +175	°C

OUTLINE DRAWING

(Unit:mm)



BACK SIDE PATTERN

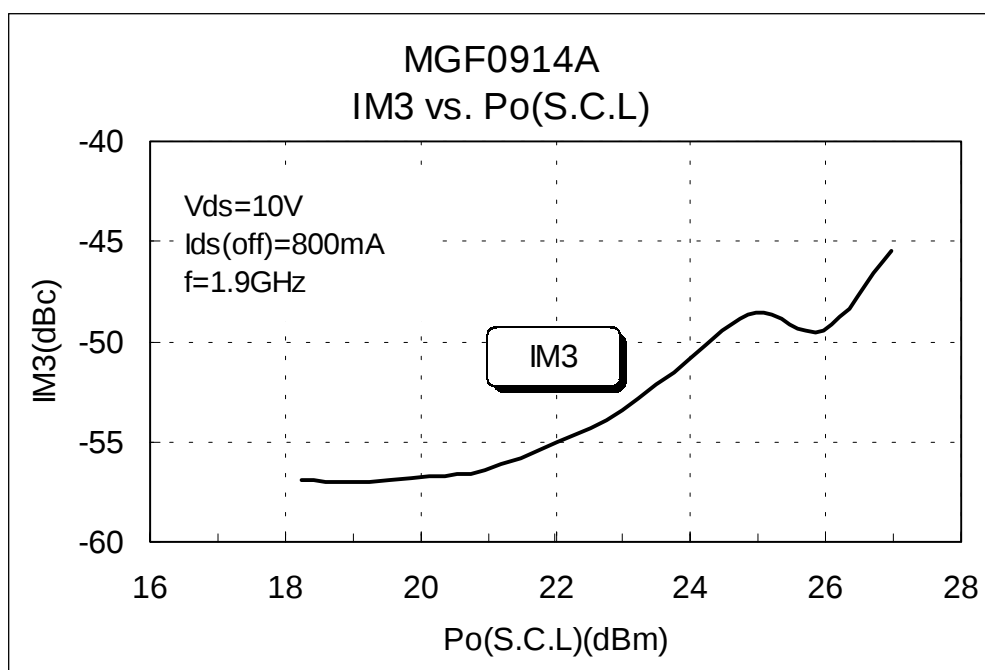
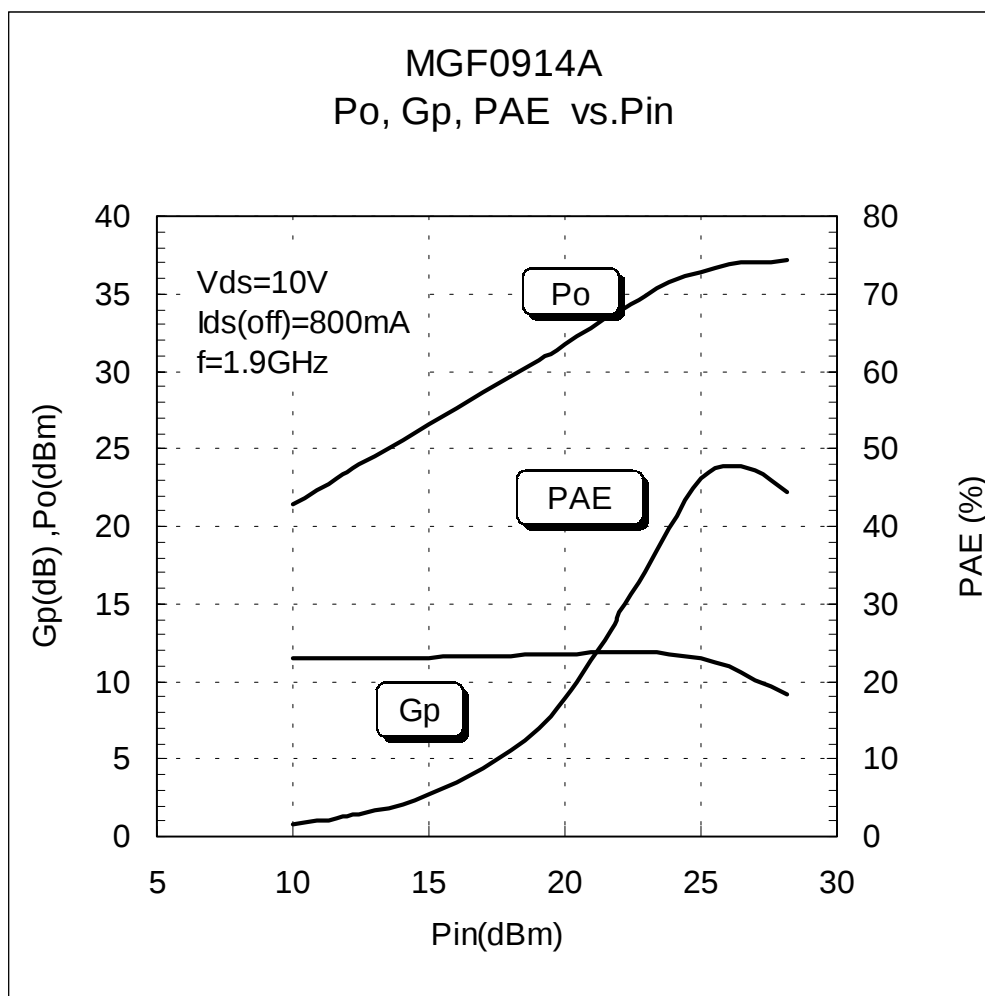


Electrical characteristics

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDSS	Saturated drain current	$V_{DS}=3\text{V}, V_{GS}=0\text{V}$	1600	2400	3200	mA
VGS(off)	Gate to source cut-off voltage	$V_{DS}=3\text{V}, I_D=10\text{mA}$	-1	-3	-5	V
gm	Transconductance	$V_{DS}=3\text{V}, I_D=800\text{mA}$	-	800	-	mS
Po	Output power	$V_{DS}=10\text{V}, I_D=800\text{mA}, f=1.9\text{GHz}$	34	35.5	-	dBm
η_{add}	Power added Efficiency	$P_{in}=26\text{dBm}$	-	48	-	%
GLP	Linear Power Gain	$V_{DS}=10\text{V}, I_D=800\text{mA}, f=1.9\text{GHz}$	-	11	-	dB
NF	Noise figure		-	4	-	dB
Rth(ch-c)	Thermal Resistance *1	ΔV_f Method	-	-	TBD	°C/W

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

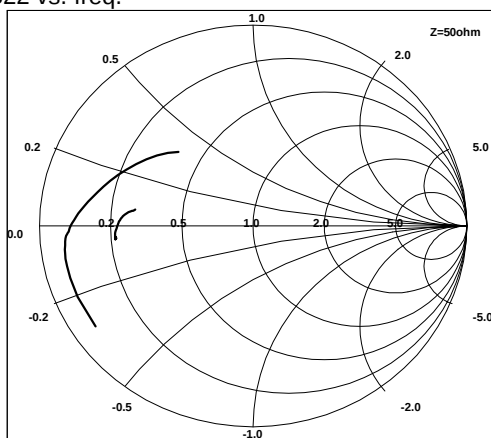
MGF0914A TYPICAL CHARACTERISTICS



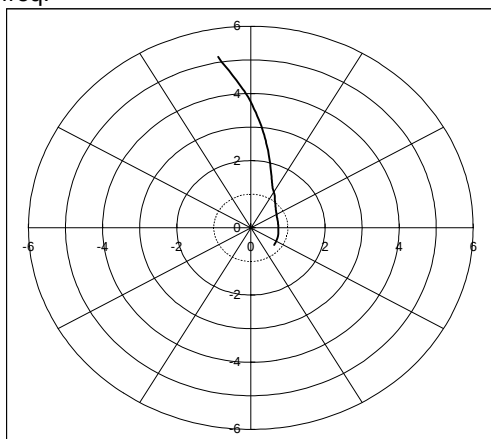
MGF0914A S PARAMETERS (Ta=25°C,Vds=10V,Id=800mA)

f	S11		S12		S21		S22		K	MSG/MAG
(GHz)	Magn.	Ang. (deg)	Magn.	Ang. (deg)	Magn.	Ang. (deg)	Magn.	Ang. (deg)		(dB)
0.4	0.891	-145.84	0.026	27.23	5.168	99.89	0.643	-174.56	0.63	23.03
0.6	0.894	-156.64	0.026	33.46	4.012	92.01	0.645	-175.02	0.48	21.87
0.8	0.894	-163.15	0.027	38.43	3.135	85.46	0.646	-175.22	0.43	20.60
1.0	0.894	-167.02	0.029	42.35	2.486	79.94	0.647	-175.23	0.44	19.31
1.2	0.893	-169.39	0.032	45.43	2.017	75.18	0.647	-175.11	0.49	18.06
1.4	0.891	-171.05	0.034	47.81	1.690	70.98	0.647	-174.92	0.55	16.92
1.6	0.888	-172.42	0.037	49.63	1.469	67.17	0.647	-174.70	0.60	15.93
1.8	0.886	-173.70	0.041	51.01	1.326	63.60	0.647	-174.49	0.63	15.11
2.0	0.883	-174.91	0.045	52.03	1.238	60.18	0.647	-174.32	0.63	14.44
2.2	0.879	-175.97	0.048	52.78	1.170	56.83	0.647	-174.19	0.62	13.84
2.4	0.876	-176.79	0.052	53.30	1.087	53.50	0.647	-174.14	0.65	13.17
2.6	0.872	-177.33	0.057	53.63	1.018	50.15	0.648	-174.18	0.67	12.55
2.8	0.868	-177.67	0.061	53.79	0.961	46.78	0.648	-174.30	0.70	11.98
3.0	0.864	-178.13	0.065	53.81	0.914	43.38	0.648	-174.51	0.72	11.45
3.2	0.859	-179.27	0.070	53.68	0.876	39.95	0.649	-174.81	0.74	10.96
3.4	0.853	-179.83	0.075	53.40	0.845	36.52	0.649	-175.20	0.76	10.49
3.6	0.846	-178.98	0.081	52.94	0.819	33.09	0.648	-175.67	0.78	10.06
3.8	0.839	-177.99	0.087	52.30	0.798	29.67	0.648	-176.21	0.80	9.64
4.0	0.830	-176.88	0.093	51.44	0.782	26.27	0.646	-176.83	0.82	9.24
4.2	0.820	-175.67	0.100	50.36	0.769	22.88	0.645	-177.52	0.85	8.86
4.4	0.809	-174.32	0.107	49.01	0.758	19.48	0.642	-178.27	0.87	8.49
4.6	0.796	-172.81	0.116	47.39	0.751	16.02	0.639	-179.09	0.90	8.13
4.8	0.781	-171.09	0.124	45.47	0.746	12.45	0.635	-179.97	0.93	7.78
5.0	0.765	-169.14	0.134	43.24	0.743	8.67	0.630	-178.51	0.96	7.43
5.2	0.747	-166.90	0.145	40.70	0.742	4.57	0.624	-177.40	0.99	7.10
5.4	0.726	-164.33	0.156	37.85	0.744	-0.01	0.618	-176.42	1.03	5.80
5.6	0.704	-161.42	0.169	34.71	0.747	-4.96	0.611	-175.51	1.06	4.96
5.8	0.681	-158.15	0.182	31.29	0.752	-9.21	0.603	-174.66	1.09	4.33
6.0	0.655	-154.53	0.197	27.66	0.759	-13.59	0.595	-173.92	1.12	3.79
6.2	0.628	-150.59	0.212	23.86	0.768	-18.33	0.587	-173.32	1.14	3.29
6.4	0.599	-146.39	0.229	19.97	0.777	-23.37	0.579	-172.85	1.17	2.84
6.6	0.570	-142.02	0.247	16.10	0.788	-28.54	0.571	-172.50	1.18	2.44
6.8	0.539	-137.62	0.266	12.35	0.798	-33.75	0.564	-172.16	1.20	2.09
7.0	0.508	-133.37	0.286	8.87	0.808	-39.12	0.558	-171.64	1.21	1.78

S11 & S22 vs. freq.



S21 vs. freq.



S12 vs. freq.

