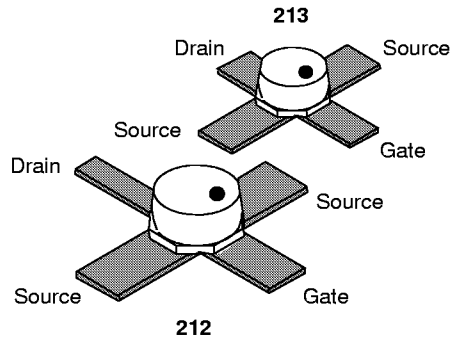
Ka Band Power GaAs MESFET Chips

Alpha

AFM06P2-212, AFM06P2-213

Features

- 22 dBm Output Power @ 18 GHz
- High Associated Gain, 9 dB @ 18 GHz
- High Power Added Efficiency, 23%
- Broadband Operation, DC–18 GHz
- 0.25 µm Ti/Pd/Au Gates
- Passivated Surface



Description

The AFM06P2-212, 213 are high performance power GaAs MESFET chips in an industry standard ceramic micro-x package, having a gate length of 0.25 µm and a total gate periphery of 600 µm. These devices have excellent gain and power performance through 26 GHz, making them suitable for a wide range of commercial and military applications in oscillator and amplifier circuits. They employ Ti/Pd/Au gate metallization and surface passivation to ensure a rugged, reliable part.

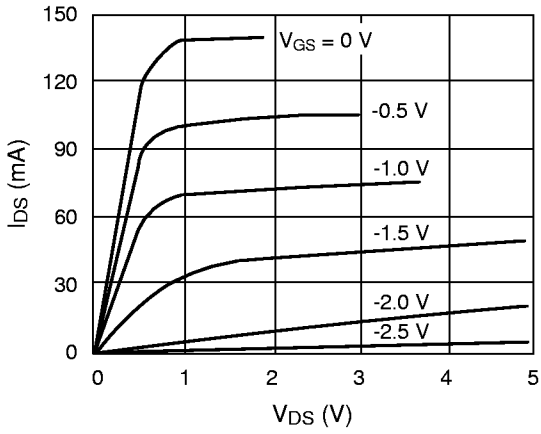
Absolute Maximum Ratings

Characteristic	Value
Drain to Source Voltage (V_{DS})	6 V
Gate to Source Voltage (V_{GS})	-4 V
Drain Current (I_{DS})	I_{DSS}
Gate Current (I_{GS})	1 mA
Total Power Dissipation (P_T)	1.1 W
Storage Temperature (T_{ST})	-65 to +150°C
Channel Temperature (T_{CH})	175°C

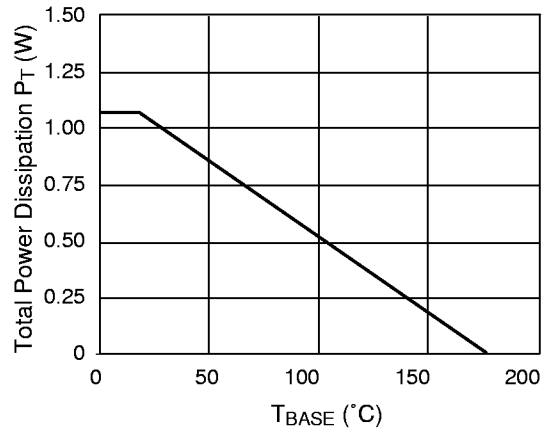
Electrical Specifications at 25°C

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Saturated Drain Current (I_{DSS})	V_{DS} = 2 V, V_{GS} = 0 V	130.0	200.0	270.0	mA
Transconductance (gm)		90.0	120.0		mS
Pinch-Off Voltage (V_P)	V_{DS} = 5 V, I_{DS} = 1.5 mA	1.0	3.0	5.0	V
Gate to Drain Breakdown Voltage (V_{bgd})	I_{GD} = 600 µA	8.0	12.0		V
Output Power at 1 dB Compression ($P_{1\ dB}$)	V_{DS} = 5 V, I_{DS} = 70 mA, F = 18 GHz		22.0		dBm
Gain at 1 dB Compression ($G_{1\ dB}$)			9.0		dB
Power Added Efficiency (ηadd)			23.0		%

Typical Performance Data



I-V



Power Derating

Typical S-Parameters (V_{DS} = 5 V, I_{DS} = 100 mA)

Freq. (GHz)	S_{11}		S_{21}		S_{12}		S_{22}		MAG/ MSG (dB)
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	
1	0.827	-37.8264	7.3390	153.0160	0.0202	76.0460	0.5006	-36.961	
2	0.841	-71.7158	6.0499	122.7182	0.0340	57.6193	0.3925	-44.484	22.5047
3	0.776	-95.9016	5.0784	98.6981	0.0423	43.4674	0.3538	-60.536	20.7939
4	0.773	-116.1009	4.4165	83.7214	0.0496	41.8927	0.2474	-67.747	19.4986
5	0.772	-136.3639	4.0687	61.0411	0.0574	28.5307	0.2514	-80.500	18.5080
6	0.729	-159.5267	3.6170	42.4229	0.0621	20.3616	0.2539	-105.251	17.6540
7	0.652	177.0366	3.3407	26.8719	0.0695	14.1562	0.2666	-122.438	14.9166
8	0.680	154.3013	3.1085	11.1292	0.0769	9.6583	0.2744	-136.476	16.0668
9	0.720	135.1126	2.8509	-1.4693	0.0818	3.2226	0.2352	-147.323	15.4208
10	0.666	117.7185	2.6700	-17.9531	0.0898	-5.3931	0.2551	-164.635	13.3968
11	0.631	100.5973	2.3131	-33.8962	0.0907	-14.6182	0.2561	178.758	10.7345
12	0.644	76.8920	2.0077	-49.6463	0.0921	-24.4491	0.2076	166.633	9.1700
13	0.657	64.6829	1.9441	-62.8550	0.1041	-27.3280	0.2744	135.000	9.2358
14	0.748	52.4407	1.8819	-81.2585	0.1203	-42.4402	0.3667	119.222	11.9422
15	0.847	37.8038	1.7404	-98.7912	0.1282	-56.5826	0.3722	107.510	11.3280
16	0.850	22.3398	1.5849	-114.6893	0.1336	-70.6290	0.3581	88.987	10.7432
17	0.805	8.2106	1.4012	-126.9353	0.1314	-79.1178	0.3802	62.424	10.2803
18	0.847	-2.1121	1.2311	-137.7326	0.1283	-86.3122	0.4026	43.087	9.8217
19	0.831	-5.6214	1.1617	-149.0193	0.1356	-95.3322	0.5087	38.695	9.3289
20	0.791	-6.5681	1.0774	-161.2119	0.1371	-105.6583	0.5497	33.199	8.9538
21	0.866	-20.5483	1.1110	-177.5857	0.1568	-119.1149	0.4284	22.075	8.5032
22	0.836	-35.5536	1.1102	164.5367	0.1726	-134.0608	0.4058	-11.227	8.0846
23	0.853	-52.6197	1.0759	146.8712	0.1744	-148.6982	0.4751	-42.014	7.9027
24	0.958	-69.2200	1.0823	131.6291	0.1820	-161.9434	0.5114	-46.505	7.7438
25	0.844	-81.7547	1.0406	112.8443	0.1822	-177.5051	0.4558	-62.423	7.5681
26	0.733	-104.6242	0.9783	88.5591	0.1721	159.3426	0.3791	-103.875	4.2994

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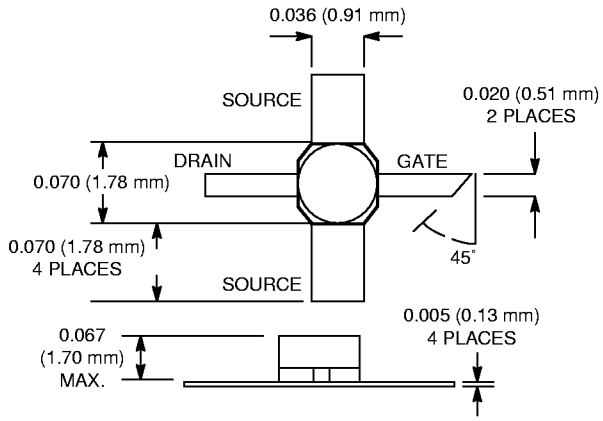
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SOURCE
0.020 (0.51 mm)
2 PLACES
DRAIN
GATE
0.070 (1.78 mm)
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45˚
SOURCE
0.005 (0.13 mm)
4 PLACES
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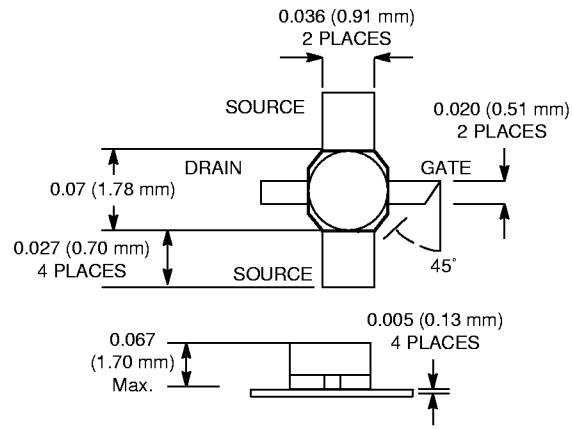
(1.70 mm)
MAX.

213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