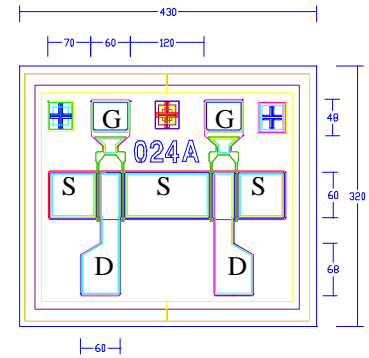


**EFA024A****PRELIMINARY DATA SHEET****Low Distortion GaAs Power FET**

- +18.0dBm TYPICAL OUTPUT POWER
- 11.0dB TYPICAL POWER GAIN AT 12GHz
- TYPICAL 1.6 dB NOISE FIGURE AND 10 dB ASSOCIATED GAIN AT 12GHz
- 0.3 X 240 MICRON RECESSED “MUSHROOM” GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- Idss SORTED IN 5mA PER BIN RANGE



Chip Thickness: 75 ± 13 microns  
All Dimensions In Microns

**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression f=12GHz	16	18		dBm
	V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz		18		
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression f=12GHz	9	11		dB
	V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz		9		
<b>PAE</b>	Power Added efficiency at 1dB Compression V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>dss</sub> f=12GHz		30		%
<b>NF</b>	Noise Figure V <sub>ds</sub> =3V, I <sub>ds</sub> =15mA f=12GHz		1.6		dB
<b>G<sub>A</sub></b>	Associated Gain V <sub>ds</sub> =3V, I <sub>ds</sub> =15mA f=12GHz		10		dB
<b>I<sub>dss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	35	60	85	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	30	40		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =1.0mA		-2	-3.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =100uA	-8	-12		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =100uA	-6	-11		V
<b>R<sub>th</sub></b>	Thermal Resistance (Au-Sn Eutectic Attach)		135		°C/W

**MAXIMUM RATINGS AT 25 °C**

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
<b>V<sub>ds</sub></b>	Drain-Source Voltage	10V	6V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-8V	-4V
<b>I<sub>ds</sub></b>	Drain Current	I <sub>dss</sub>	I <sub>dss</sub>
<b>I<sub>gsf</sub></b>	Forward Gate Current	6mA	1mA
<b>P<sub>in</sub></b>	Input Power	19dBm	@ 3dB Compression
<b>T<sub>ch</sub></b>	Channel Temperature	175°C	150°C
<b>T<sub>stg</sub></b>	Storage Temperature	-65/175°C	-65/150°C
<b>P<sub>t</sub></b>	Total Power Dissipation	1W	830mW

Note: 1. Exceeding any of the above ratings may result in permanent damage.

2. Exceeding any of the above ratings may reduce MTTF below design goals.

**Excelics Semiconductor, Inc., 2908 Scott Blvd., Santa Clara, CA 95054**

**Phone: (408) 970-8664 Fax: (408) 970-8998 Web Site: [www.excelics.com](http://www.excelics.com)**

# EFA024A

## PRELIMINARY DATA SHEET

### Low Distortion GaAs Power FET

#### S-PARAMETERS 3V, 15mA

#### S-PARAMETERS 6V, 1/2Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---		FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.998	-11.6	3.455	169.4	0.019	80.9	0.715	-7.2	1.0	0.990	-12.5	3.579	168.3	0.012	81.1	0.807	-5.3
2.0	0.984	-23.2	3.398	160.1	0.036	74.2	0.702	-13.8	2.0	0.977	-25.3	3.516	158.5	0.025	74.8	0.801	-10.6
3.0	0.972	-34.2	3.356	151.3	0.054	67.8	0.687	-19.6	3.0	0.961	-37.5	3.459	149.2	0.036	68.2	0.788	-14.8
4.0	0.950	-44.8	3.231	142.7	0.068	61.5	0.686	-27.8	4.0	0.941	-49.2	3.324	139.4	0.045	61.1	0.783	-21.5
5.0	0.927	-53.9	3.002	133.9	0.079	55.3	0.677	-32.9	5.0	0.920	-59.3	3.055	130.4	0.051	55.2	0.778	-26.2
6.0	0.908	-65.5	2.966	125.3	0.092	49.0	0.637	-36.8	6.0	0.902	-72.1	2.990	121.3	0.059	49.9	0.748	-27.6
7.0	0.878	-75.5	2.918	117.6	0.105	43.3	0.609	-44.2	7.0	0.878	-82.5	2.943	113.3	0.068	45.2	0.720	-32.5
8.0	0.859	-81.6	2.669	110.1	0.108	37.7	0.606	-51.2	8.0	0.865	-88.2	2.674	105.6	0.069	40.5	0.717	-39.6
9.0	0.853	-90.4	2.498	102.9	0.114	32.3	0.582	-53.6	9.0	0.859	-96.2	2.473	98.4	0.071	35.4	0.707	-42.1
10.0	0.835	-99.4	2.415	96.2	0.120	27.5	0.544	-57.1	10.0	0.843	-104.7	2.388	91.7	0.074	30.6	0.678	-45.2
11.0	0.827	-106.4	2.294	89.5	0.123	23.1	0.527	-62.9	11.0	0.837	-110.5	2.264	85.0	0.075	27.8	0.670	-50.8
12.0	0.815	-114.4	2.186	83.0	0.127	18.1	0.500	-67.0	12.0	0.824	-117.6	2.159	78.4	0.078	24.3	0.652	-54.5
13.0	0.799	-120.5	2.100	76.9	0.131	14.2	0.484	-75.5	13.0	0.808	-122.8	2.092	72.1	0.080	20.6	0.643	-62.9
14.0	0.796	-123.4	1.901	72.1	0.127	11.5	0.515	-79.5	14.0	0.803	-125.6	1.881	66.3	0.076	17.6	0.672	-69.2
15.0	0.816	-134.9	1.817	65.9	0.127	7.0	0.492	-74.4	15.0	0.814	-137.5	1.782	60.2	0.077	15.0	0.675	-64.7
16.0	0.802	-146.3	1.910	58.4	0.142	2.0	0.416	-83.9	16.0	0.803	-149.5	1.897	52.5	0.085	11.3	0.616	-69.2
17.0	0.752	-139.3	1.791	54.4	0.142	0.3	0.477	-105.8	17.0	0.766	-143.3	1.783	46.6	0.086	8.7	0.651	-89.0
18.0	0.773	-145.1	1.562	50.2	0.130	-1.6	0.540	-98.6	18.0	0.784	-149.9	1.506	42.6	0.077	8.4	0.713	-85.2
19.0	0.776	-163.9	1.620	43.2	0.141	-6.2	0.462	-87.8	19.0	0.789	-168.5	1.545	36.7	0.084	6.1	0.672	-72.2
20.0	0.729	-171.0	1.607	33.7	0.148	-12.9	0.452	-118.6	20.0	0.760	-175.1	1.583	25.9	0.091	-0.6	0.630	-95.3
21.0	0.715	-168.2	1.559	32.7	0.150	-12.3	0.529	-113.0	21.0	0.753	-173.0	1.505	24.3	0.092	1.2	0.689	-94.8
22.0	0.733	-167.4	1.470	30.0	0.147	-12.6	0.487	-113.4	22.0	0.767	-170.3	1.423	22.6	0.092	3.2	0.669	-95.5
23.0	0.737	179.0	1.398	20.7	0.148	-18.8	0.459	-125.1	23.0	0.772	177.9	1.371	12.9	0.093	-3.0	0.634	-106.0
24.0	0.736	175.2	1.353	17.6	0.149	-19.7	0.500	-123.0	24.0	0.768	174.8	1.329	8.9	0.096	-3.1	0.671	-108.4
25.0	0.751	174.5	1.306	13.3	0.148	-20.7	0.431	-130.3	25.0	0.776	175.3	1.303	4.5	0.098	-2.8	0.633	-115.5
26.0	0.746	166.7	1.241	5.3	0.145	-26.7	0.482	-148.0	26.0	0.769	167.3	1.234	-6.0	0.097	-8.8	0.668	-133.3

Note: The data included 0.7 mils diameter Au bonding wires:  
2 gate wires, 15 mils each; 2 drain wires, 20 mils each; 6 source wires, 10 mils each.

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传真：0755-83376182 (0) 13823648918 MSN: SUNS8888@hotmail.com

邮编：518033 E-mail:szss20@163.com QQ: 195847376

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西安分公司：西安高新开发区 20 所(中国电子科技集团导航技术研究所)

西安劳动南路 88 号电子商城二楼 D23 号

TEL: 029-81022619 13072977981 FAX:029-88789382