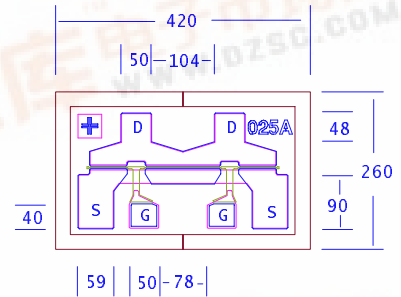


## DATA SHEET

### Low Distortion GaAs Power FET

- +21.0dBm TYPICAL OUTPUT POWER
- 11.0dB TYPICAL POWER GAIN AT 12GHz
- TYPICAL 1.5 dB NOISE FIGURE AND 10 dB ASSOCIATED GAIN AT 12GHz
- 0.3 X 250 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
P <sub>1dB</sub>	Output Power at 1dB Compression f=12GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz	19	21 21		dBm
G <sub>1dB</sub>	Gain at 1dB Compression f=12GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz	9	11 9		dB
PAE	Power Added efficiency at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=12GHz		38		%
NF	Noise Figure V <sub>ds</sub> =3V, I <sub>ds</sub> =15mA f=12GHz		1.5		dB
GA	Associated Gain V <sub>ds</sub> =3V, I <sub>ds</sub> =15mA f=12GHz		10		dB
I <sub>dss</sub>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	35	65	105	mA
G <sub>m</sub>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	30	40		mS
V <sub>p</sub>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =1.0mA		-2	-3.5	V
BV <sub>gd</sub>	Drain Breakdown Voltage I <sub>gd</sub> =1.0mA	-12	-15		V
BV <sub>gs</sub>	Source Breakdown Voltage I <sub>gs</sub> =1.0mA	-7	-14		V
R <sub>th</sub>	Thermal Resistance (Au-Sn Eutectic Attach)		155		°C/W

### MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>ds</sub>	Drain-Source Voltage	12V	8V
V <sub>gs</sub>	Gate-Source Voltage	-8V	-4V
I <sub>ds</sub>	Drain Current	I <sub>dss</sub>	90mA
I <sub>gsf</sub>	Forward Gate Current	6mA	1mA
P <sub>in</sub>	Input Power	19dBm	@ 3dB Compression
T <sub>ch</sub>	Channel Temperature	175°C	150°C
T <sub>stg</sub>	Storage Temperature	-65/175°C	-65/150°C
P <sub>t</sub>	Total Power Dissipation	880mW	730mW

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

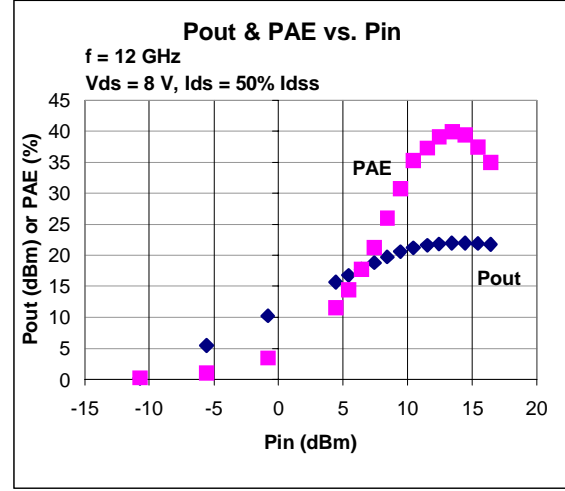
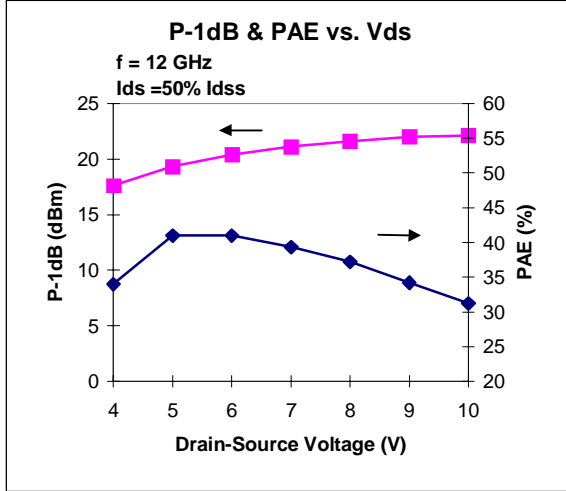
2. Exceeding any of the above ratings may reduce MTTF below design goals.

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)

## DATA SHEET

### Low Distortion GaAs Power FET



### S-PARAMETERS 3V, 15mA

### S-PARAMETERS 8V, Idss

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.995	-13.5	3.600	168.7	0.023	81.5	0.606	-8.1
2.0	0.976	-26.7	3.527	158.2	0.044	72.7	0.595	-15.9
3.0	0.957	-39.7	3.434	148.1	0.064	64.8	0.569	-24.3
4.0	0.931	-53.0	3.313	137.7	0.081	57.1	0.544	-33.3
5.0	0.906	-63.9	3.119	128.8	0.094	50.5	0.536	-41.2
6.0	0.875	-74.0	2.938	120.2	0.106	44.0	0.512	-48.3
7.0	0.846	-84.0	2.796	111.9	0.116	38.1	0.496	-57.0
8.0	0.818	-93.6	2.625	103.9	0.124	32.4	0.484	-64.2
9.0	0.797	-102.4	2.468	96.8	0.129	27.4	0.475	-69.6
10.0	0.781	-110.6	2.330	90.0	0.133	22.2	0.456	-75.0
11.0	0.762	-119.0	2.206	83.1	0.137	17.6	0.448	-81.0
12.0	0.752	-127.5	2.075	76.5	0.139	13.3	0.429	-86.0
13.0	0.749	-134.0	1.940	70.6	0.138	9.3	0.432	-92.2
14.0	0.747	-138.4	1.825	65.8	0.137	6.7	0.444	-93.6
15.0	0.745	-142.8	1.763	61.5	0.140	4.3	0.432	-93.1
16.0	0.738	-150.1	1.728	55.4	0.145	0.7	0.399	-99.1
17.0	0.729	-157.5	1.648	49.0	0.147	-3.4	0.400	-107.7
18.0	0.727	-163.1	1.574	43.9	0.147	-6.1	0.397	-110.9
19.0	0.729	-167.9	1.532	38.6	0.150	-8.7	0.376	-117.7
20.0	0.718	-173.0	1.482	32.5	0.152	-12.3	0.386	-129.5
21.0	0.709	-175.0	1.429	28.1	0.153	-14.5	0.393	-134.4
22.0	0.709	178.6	1.365	22.5	0.153	-17.5	0.386	-142.4
23.0	0.706	173.1	1.295	16.6	0.150	-20.2	0.403	-150.8
24.0	0.714	166.8	1.211	11.0	0.145	-23.3	0.434	-158.6
25.0	0.735	162.8	1.147	6.6	0.141	-24.7	0.455	-160.4
26.0	0.738	161.3	1.056	2.9	0.132	-26.2	0.490	-165.6

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.96	-14.6	4.413	167.5	0.017	52.8	0.699	-5.5
2.0	0.954	-29.2	4.255	156.5	0.031	58.8	0.698	-12.1
3.0	0.923	-42.9	4.083	145.2	0.044	56.1	0.684	-18.9
4.0	0.898	-55.1	3.865	135.2	0.054	51.5	0.665	-25.3
5.0	0.871	-66.3	3.651	125.5	0.063	46.3	0.644	-31.6
6.0	0.848	-76.4	3.422	116.7	0.069	42.2	0.625	-37.4
7.0	0.824	-85.7	3.203	108.7	0.074	37.8	0.608	-43.0
8.0	0.811	-94.4	3.021	100.7	0.078	32.7	0.595	-48.7
9.0	0.785	-102.5	2.81	93.5	0.08	27.9	0.577	-54.0
10.0	0.77	-109.7	2.639	87.0	0.079	23.8	0.564	-58.7
11.0	0.762	-116.6	2.49	80.6	0.08	20.3	0.553	-63.4
12.0	0.756	-123.4	2.358	74.1	0.079	17.6	0.541	-67.9
13.0	0.757	-129.6	2.239	68.2	0.081	13.9	0.531	-72.3
14.0	0.756	-135.5	2.136	62.2	0.08	11.7	0.517	-76.9
15.0	0.761	-140.7	2.051	56.3	0.079	8.7	0.506	-82.2
16.0	0.762	-146.0	1.965	50.0	0.082	7.9	0.496	-88.9
17.0	0.763	-150.2	1.891	44.2	0.084	5.2	0.477	-96.8
18.0	0.766	-154.6	1.837	38.0	0.087	3.9	0.465	-106.0
19.0	0.762	-158.5	1.775	31.4	0.089	1.7	0.462	-115.8
20.0	0.751	-162.4	1.7	24.6	0.092	-0.7	0.465	-127.1
21.0	0.73	-165.4	1.594	18.2	0.093	-3.3	0.473	-138.2
22.0	0.71	-167.8	1.52	12.8	0.093	-3.1	0.489	-148.5
23.0	0.707	-169.4	1.457	7.9	0.093	-0.8	0.519	-156.4
24.0	0.71	-171.7	1.41	2.5	0.097	-0.2	0.555	-163.8
25.0	0.72	-175.6	1.351	-3.6	0.101	2.4	0.578	-170.1
26.0	0.712	-178.1	1.29	-7.2	0.103	3.8	0.603	-173.3

Note: The data included 0.7 mils diameter Au bonding wires:  
2 gate wires, 15 mils each; 2 drain wires, 20 mils each; 4 source wires, 7 mils each.

# EFA025A

## DATA SHEET

### Low Distortion GaAs Power FET

<b>EFA025A Noise Parameters Vds=3V, Ids=15mA</b>				
Freq.	Popt		Nfmin	Rn/50
(GHz)	(MAG)	(ANG)	(dB)	
2	0.71	17	0.53	0.58
4	0.67	35	0.65	0.52
6	0.81	48	0.85	0.49
8	0.71	63	1.05	0.44
10	0.65	79	1.35	0.38
12	0.70	95	1.55	0.34
14	0.65	105	1.90	0.29
16	0.61	120	2.25	0.25
18	0.70	135	2.60	0.17
20	0.65	145	2.90	0.15
22	0.64	153	3.20	0.12
24	0.69	164	3.50	0.08
26	0.70	175	3.80	0.05