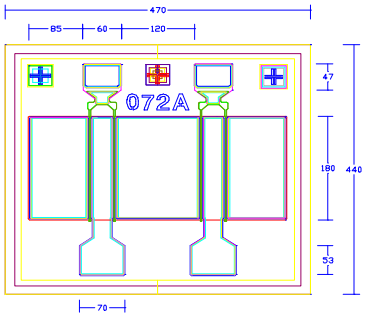
Excelics EFA072A

PRELIMINARY DATA SHEET

Low Distortion GaAs Power FET

- **+25.0dBm TYPICAL OUTPUT POWER**
- **10.0dB TYPICAL POWER GAIN AT 12GHz**
- **0.3 X 720 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY**
- **Idss SORTED IN 15mA PER BIN RANGE**



Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression f=12GHz Vds=8V, Ids=50% Idss f=18GHz	22.5	25.0 25.0		dBm
G_{1dB}	Gain at 1dB Compression f=12GHz Vds=8V, Ids=50% Idss f=18GHz	8.0	10.0 7.5		dB
PAE	Power Added Efficiency at 1dB Compression Vds=8V, Ids=50% Idss f=12GHz		32		%
Idss	Saturated Drain Current Vds=3V, Vgs=0V	120	190	270	mA
Gm	Transconductance Vds=3V, Vgs=0V	80	110		mS
Vp	Pinch-off Voltage Vds=3V, Ids=2.0mA		-2.0	-3.5	V
BVgd	Drain Breakdown Voltage Igd=1.0mA	-12	-15		V
BVgs	Source Breakdown Voltage Igs=1.0mA	-7	-14		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)		55		°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	12V	8V
Vgs	Gate-Source Voltage	-8V	-4V
Ids	Drain Current	Idss	260Ma
Igsf	Forward Gate Current	20mA	4mA
Pin	Input Power	25dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	Total Power Dissipation	2.5 W	2.1 W

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.

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EFA072A

PRELIMINARY DATA SHEET

Low Distortion GaAs Power FE

S-PARAMETERS
6V, 100 mA

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.975	-29.2	7.010	158.8	0.020	73.8	0.387	-18.9
2.0	0.933	-55.6	6.350	140.9	0.037	59.8	0.365	-37.6
3.0	0.899	-77.3	5.596	126.0	0.049	48.7	0.357	-52.5
4.0	0.862	-95.5	4.962	114.2	0.057	41.2	0.379	-61.2
5.0	0.844	-106.9	4.290	104.2	0.061	35.9	0.346	-68.4
6.0	0.822	-120.9	3.774	93.1	0.064	29.0	0.331	-83.0
7.0	0.802	-132.2	3.402	85.0	0.065	25.4	0.351	-86.5
8.0	0.805	-136.0	3.083	79.0	0.066	23.5	0.328	-90.0
9.0	0.805	-141.5	2.754	71.6	0.066	20.6	0.310	-102.9
10.0	0.797	-149.6	2.504	64.3	0.064	17.6	0.328	-110.6
11.0	0.802	-154.5	2.296	58.2	0.064	17.1	0.333	-117.5
12.0	0.802	-160.8	2.097	51.5	0.064	15.7	0.356	-125.0
13.0	0.803	-166.1	1.963	45.9	0.064	14.2	0.368	-127.2
14.0	0.813	-167.4	1.805	40.8	0.062	15.0	0.374	-137.6
15.0	0.828	-175.8	1.581	33.5	0.059	11.8	0.438	-143.2
16.0	0.834	171.5	1.508	27.3	0.060	11.4	0.472	-133.5
17.0	0.819	177.2	1.514	24.7	0.066	14.1	0.439	-141.8
18.0	0.833	176.8	1.311	20.0	0.062	15.5	0.495	-154.0
19.0	0.832	160.7	1.194	13.2	0.061	13.5	0.550	-143.2
20.0	0.824	156.5	1.151	8.4	0.065	13.3	0.564	-143.6
21.0	0.834	155.4	1.223	4.4	0.077	14.3	0.508	-148.1
22.0	0.821	162.6	1.109	1.4	0.075	16.7	0.554	-163.5
23.0	0.833	154.1	1.012	-4.1	0.075	17.6	0.578	-161.8
24.0	0.832	149.9	1.017	-9.0	0.083	16.3	0.571	-165.5
25.0	0.831	151.9	0.939	-12.6	0.086	17.9	0.602	-175.8
26.0	0.834	144.0	0.899	-18.7	0.090	16.8	0.611	-175.8

S-PARAMETERS
8V,1/2Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.972	-29.7	7.064	158.3	0.021	73.2	0.452	-17.3
2.0	0.931	-56.4	6.382	140.1	0.037	59.1	0.425	-33.8
3.0	0.896	-78.4	5.605	124.8	0.048	48.3	0.410	-47.2
4.0	0.858	-96.7	4.934	112.8	0.055	40.4	0.425	-55.4
5.0	0.842	-108.0	4.273	102.8	0.059	34.9	0.394	-61.9
6.0	0.820	-121.9	3.754	91.5	0.060	28.5	0.373	-75.1
7.0	0.802	-133.1	3.377	83.2	0.062	24.6	0.392	-78.9
8.0	0.805	-136.8	3.059	77.3	0.063	23.8	0.371	-81.9
9.0	0.804	-142.3	2.738	69.9	0.062	20.0	0.350	-93.8
10.0	0.799	-150.2	2.483	62.4	0.061	17.3	0.366	-102.0
11.0	0.803	-155.2	2.286	55.9	0.061	16.9	0.369	-108.6
12.0	0.803	-161.4	2.079	49.1	0.059	14.9	0.391	-116.3
13.0	0.805	-166.7	1.943	43.4	0.059	14.4	0.405	-119.2
14.0	0.816	-167.9	1.791	38.1	0.059	15.2	0.408	-129.4
15.0	0.832	-176.3	1.564	30.4	0.055	14.4	0.471	-136.1
16.0	0.837	171.1	1.482	23.9	0.056	12.6	0.510	-127.7
17.0	0.823	176.7	1.491	21.4	0.061	15.2	0.479	-135.6
18.0	0.836	176.6	1.293	16.4	0.058	15.9	0.530	-148.1
19.0	0.835	160.3	1.167	9.5	0.058	15.4	0.587	-138.7
20.0	0.827	156.2	1.121	4.6	0.060	16.0	0.605	-139.5
21.0	0.837	154.9	1.197	0.5	0.070	18.2	0.549	-143.6
22.0	0.825	162.2	1.088	-2.7	0.071	20.4	0.595	-158.9
23.0	0.837	153.9	0.986	-8.4	0.071	20.2	0.622	-158.1
24.0	0.836	149.3	0.991	-13.5	0.080	20.0	0.615	-161.4
25.0	0.837	151.2	0.921	-17.9	0.084	20.7	0.649	-172.1
26.0	0.842	143.3	0.867	-23.9	0.088	20.8	0.656	-172.4

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.