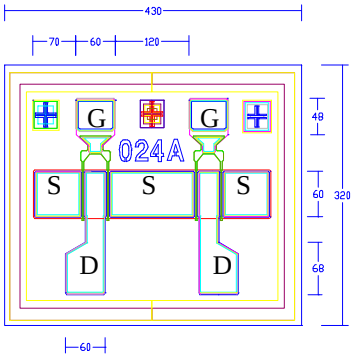
Excelics EFA024A

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_3N_4 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_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression	f=12GHz	16	18		dBm
	Vds=6V, Ids=50% Idss	f=18GHz		18		
G_{1dB}	Gain at 1dB Compression	f=12GHz	9	11		dB
	Vds=6V, Ids=50% Idss	f=18GHz		9		
PAE	Power Added efficiency at 1dB Compression					%
	Vds=6V, Ids=50% Idss	f=12GHz		30		
NF	Noise Figure Vds=3V,Ids=15mA	f=12GHz		1.6		dB
GA	Associated Gain Vds=3V,Ids=15mA	f=12GHz		10		dB
Idss	Saturated Drain Current Vds=3V, Vgs=0V		35	60	85	mA
Gm	Transconductance Vds=3V, Vgs=0V		30	40		mS
Vp	Pinch-off Voltage Vds=3V, Ids=1.0mA			-2	-3.5	V
BVgd	Drain Breakdown Voltage Igd=100uA		-8	-12		V
BVgs	Source Breakdown Voltage Igs=100uA		-6	-11		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)			135		°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	10V	6V
Vgs	Gate-Source Voltage	-8V	-4V
Ids	Drain Current	Idss	Idss
Igsf	Forward Gate Current	6mA	1mA
Pin	Input Power	19dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	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.

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PRELIMINARY DATA SHEET

Low Distortion GaAs Power FET

S-PARAMETERS
3V, 15mA

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	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
2.0	0.984	-23.2	3.398	160.1	0.036	74.2	0.702	-13.8
3.0	0.972	-34.2	3.356	151.3	0.054	67.8	0.687	-19.6
4.0	0.950	-44.8	3.231	142.7	0.068	61.5	0.686	-27.8
5.0	0.927	-53.9	3.002	133.9	0.079	55.3	0.677	-32.9
6.0	0.908	-65.5	2.966	125.3	0.092	49.0	0.637	-36.8
7.0	0.878	-75.5	2.918	117.6	0.105	43.3	0.609	-44.2
8.0	0.859	-81.6	2.669	110.1	0.108	37.7	0.606	-51.2
9.0	0.853	-90.4	2.498	102.9	0.114	32.3	0.582	-53.6
10.0	0.835	-99.4	2.415	96.2	0.120	27.5	0.544	-57.1
11.0	0.827	-106.4	2.294	89.5	0.123	23.1	0.527	-62.9
12.0	0.815	-114.4	2.186	83.0	0.127	18.1	0.500	-67.0
13.0	0.799	-120.5	2.100	76.9	0.131	14.2	0.484	-75.5
14.0	0.796	-123.4	1.901	72.1	0.127	11.5	0.515	-79.5
15.0	0.816	-134.9	1.817	65.9	0.127	7.0	0.492	-74.4
16.0	0.802	-146.3	1.910	58.4	0.142	2.0	0.416	-83.9
17.0	0.752	-139.3	1.791	54.4	0.142	0.3	0.477	-105.8
18.0	0.773	-145.1	1.562	50.2	0.130	-1.6	0.540	-98.6
19.0	0.776	-163.9	1.620	43.2	0.141	-6.2	0.462	-87.8
20.0	0.729	-171.0	1.607	33.7	0.148	-12.9	0.452	-118.6
21.0	0.715	-168.2	1.559	32.7	0.150	-12.3	0.529	-113.0
22.0	0.733	-167.4	1.470	30.0	0.147	-12.6	0.487	-113.4
23.0	0.737	179.0	1.398	20.7	0.148	-18.8	0.459	-125.1
24.0	0.736	175.2	1.353	17.6	0.149	-19.7	0.500	-123.0
25.0	0.751	174.5	1.306	13.3	0.148	-20.7	0.431	-130.3
26.0	0.746	166.7	1.241	5.3	0.145	-26.7	0.482	-148.0

S-PARAMETERS
6V,1/2Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.990	-12.5	3.579	168.3	0.012	81.1	0.807	-5.3
2.0	0.977	-25.3	3.516	158.5	0.025	74.8	0.801	-10.6
3.0	0.961	-37.5	3.459	149.2	0.036	68.2	0.788	-14.8
4.0	0.941	-49.2	3.324	139.4	0.045	61.1	0.783	-21.5
5.0	0.920	-59.3	3.055	130.4	0.051	55.2	0.778	-26.2
6.0	0.902	-72.1	2.990	121.3	0.059	49.9	0.748	-27.6
7.0	0.878	-82.5	2.943	113.3	0.068	45.2	0.720	-32.5
8.0	0.865	-88.2	2.674	105.6	0.069	40.5	0.717	-39.6
9.0	0.859	-96.2	2.473	98.4	0.071	35.4	0.707	-42.1
10.0	0.843	-104.7	2.388	91.7	0.074	30.6	0.678	-45.2
11.0	0.837	-110.5	2.264	85.0	0.075	27.8	0.670	-50.8
12.0	0.824	-117.6	2.159	78.4	0.078	24.3	0.652	-54.5
13.0	0.808	-122.8	2.092	72.1	0.080	20.6	0.643	-62.9
14.0	0.803	-125.6	1.881	66.3	0.076	17.6	0.672	-69.2
15.0	0.814	-137.5	1.782	60.2	0.077	15.0	0.675	-64.7
16.0	0.803	-149.5	1.897	52.5	0.085	11.3	0.616	-69.2
17.0	0.766	-143.3	1.783	46.6	0.086	8.7	0.651	-89.0
18.0	0.784	-149.9	1.506	42.6	0.077	8.4	0.713	-85.2
19.0	0.789	-168.5	1.545	36.7	0.084	6.1	0.672	-72.2
20.0	0.760	-175.1	1.583	25.9	0.091	-0.6	0.630	-95.3
21.0	0.753	-173.0	1.505	24.3	0.092	1.2	0.689	-94.8
22.0	0.767	-170.3	1.423	22.6	0.092	3.2	0.669	-95.5
23.0	0.772	177.9	1.371	12.9	0.093	-3.0	0.634	-106.0
24.0	0.768	174.8	1.329	8.9	0.096	-3.1	0.671	-108.4
25.0	0.776	175.3	1.303	4.5	0.098	-2.8	0.633	-115.5
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.