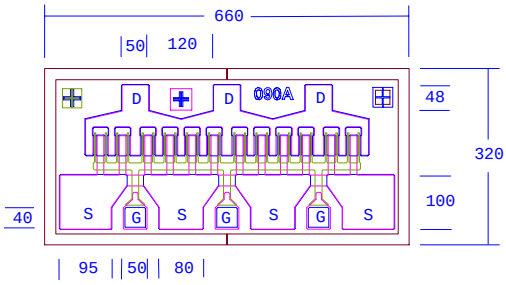
Excelics EPA090A

DATA SHEET
High Efficiency Heterojunction Power FET

- **+28.0dBm TYPICAL OUTPUT POWER**
- **10.0dB TYPICAL POWER GAIN AT 18GHz**
- **0.3 X 900 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY**
- **Idss SORTED IN 20mA 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 Vds=8V, Ids=50% Idss	f=12GHz f=18GHz	26.5	28.0 28.0		dBm
G_{1dB}	Gain at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz f=18GHz	11.5	13.0 10.0		dB
PAE	Power Added Efficiency at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz		45		%
Idss	Saturated Drain Current Vds=3V, Vgs=0V		160	270	380	mA
Gm	Transconductance Vds=3V, Vgs=0V		180	290		mS
Vp	Pinch-off Voltage Vds=3V, Ids=3.0mA			-1.0	-2.5	V
BVgd	Drain Breakdown Voltage Igd=1.0mA		-11	-15		V
BVgs	Source Breakdown Voltage Igs=1.0mA		-7	-14		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)			45		°C/W

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	12V	8V
Vgs	Gate-Source Voltage	-8V	-3V
Ids	Drain Current	Idss	315mA
Igsf	Forward Gate Current	45mA	7.5mA
Pin	Input Power	26dBm	@3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	Total Power Dissipation	3.0 W	2.5W

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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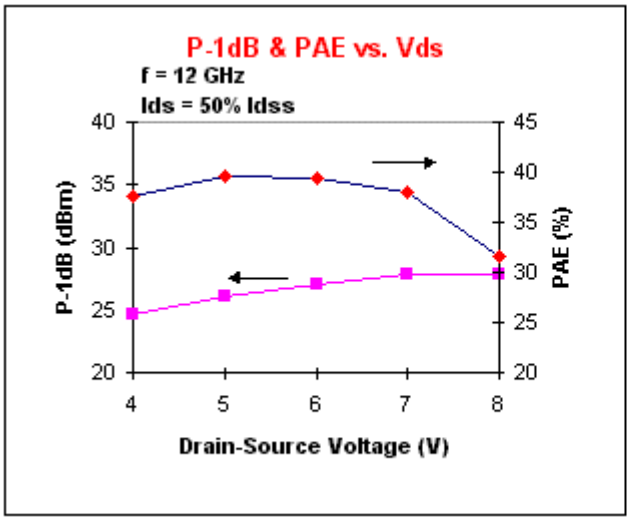

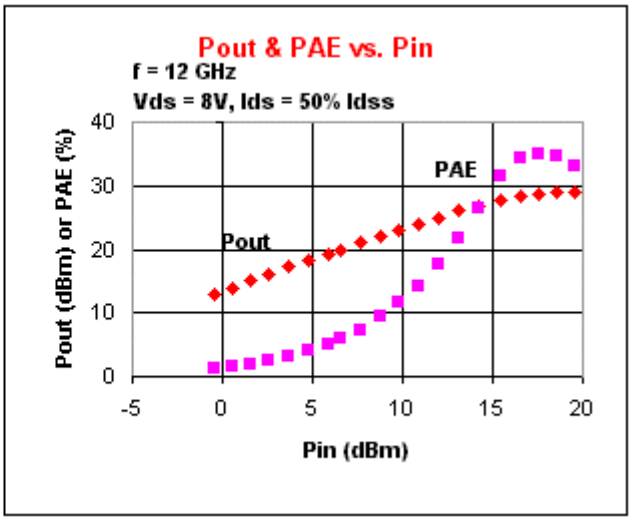

S-PARAMETERS

8V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.913	-76.1	14.462	135.6	0.033	50.3	0.347	-57.3
2.0	0.884	-115.9	9.815	112.5	0.044	31.1	0.295	-90.6
3.0	0.869	-135.9	7.119	98.8	0.048	21.9	0.279	-108.1
4.0	0.869	-147.8	5.534	89.0	0.048	16.9	0.284	-118.8
5.0	0.873	-155.3	4.499	81.4	0.049	13.0	0.294	-125.7
6.0	0.872	-160.8	3.792	74.7	0.048	11.3	0.315	-129.8
7.0	0.871	-165.4	3.265	68.6	0.048	9.2	0.341	-132.7
8.0	0.871	-169.3	2.856	63.0	0.047	7.4	0.367	-134.7
9.0	0.872	-172.6	2.525	57.7	0.045	6.8	0.392	-136.4
10.0	0.875	-175.4	2.267	52.8	0.044	6.3	0.418	-137.6
11.0	0.880	-178.2	2.046	47.9	0.044	5.5	0.440	-139.3
12.0	0.884	179.5	1.861	43.2	0.042	5.1	0.462	-141.2
13.0	0.888	177.3	1.698	38.7	0.041	4.9	0.481	-143.3
14.0	0.890	175.2	1.563	34.1	0.041	5.5	0.497	-145.7
15.0	0.899	172.8	1.457	29.5	0.041	5.7	0.513	-148.5
16.0	0.901	170.7	1.357	24.8	0.040	2.9	0.528	-151.9
17.0	0.906	168.4	1.269	19.9	0.040	2.9	0.543	-155.9
18.0	0.912	166.4	1.193	15.4	0.041	3.9	0.557	-159.7
19.0	0.912	164.3	1.131	10.4	0.042	2.6	0.573	-164.5
20.0	0.913	162.0	1.068	5.6	0.044	1.8	0.591	-168.6
21.0	0.915	160.0	0.971	2.0	0.042	4.5	0.631	-173.0
22.0	0.917	159.2	0.907	-2.5	0.043	5.1	0.660	-176.7
23.0	0.912	158.0	0.851	-6.7	0.043	5.6	0.687	-179.7
24.0	0.912	156.7	0.800	-10.7	0.044	7.0	0.713	178.1
25.0	0.918	155.2	0.754	-14.6	0.047	8.4	0.735	176.2
26.0	0.914	154.4	0.713	-17.5	0.046	10.8	0.761	175.6
27.0	0.912	152.8	0.672	-20.4	0.049	12.8	0.768	175.1
28.0	0.914	151.6	0.643	-23.0	0.052	13.7	0.771	175.3
29.0	0.919	149.8	0.617	-25.6	0.055	15.1	0.781	175.9
30.0	0.917	147.5	0.591	-28.5	0.057	12.5	0.782	175.6
31.0	0.933	146.1	0.567	-31.1	0.058	14.1	0.779	175.5
32.0	0.932	144.1	0.545	-33.7	0.057	14.0	0.781	174.3
33.0	0.931	142.9	0.523	-36.9	0.058	13.6	0.778	171.9
34.0	0.937	140.9	0.502	-40.4	0.057	13.3	0.777	168.7
35.0	0.951	139.6	0.482	-43.7	0.058	14.9	0.783	163.5
36.0	0.953	139.1	0.464	-47.4	0.060	12.2	0.792	157.1
37.0	0.969	138.2	0.449	-51.3	0.063	7.4	0.808	150.0
38.0	0.982	136.7	0.435	-55.6	0.065	-2.0	0.810	142.8
39.0	0.998	134.0	0.417	-61.8	0.067	-11.4	0.810	136.7
40.0	0.977	132.3	0.402	-67.4	0.069	-20.3	0.810	131.8

Note: The data included 0.7 mils diameter Au bonding wires:
3 gate wires, 15 mils each; 3 drain wires, 20 mils each; 8 source wires, 7 mils each.