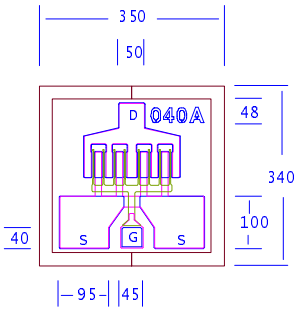
Excelics EFA040A

DATA SHEET

Low Distortion GaAs Power FET

- **+23.0dBm TYPICAL OUTPUT POWER**
- **10.5 dB TYPICAL POWER GAIN AT 12GHz**
- **0.3 X 400 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY**
- **Idss SORTED IN 10mA 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	21.0	23.0 23.0		dBm
G_{1dB}	Gain at 1dB Compression Vds=8V, Ids=50% Idss	f=12GHz f=18GHz	9.0	10.5 8.0		dB
PAE	Gain at 1dB Compression Vds=8V, Ids=50% Idss	 f=12GHz		 35		%
Idss	Saturated Drain Current Vds=3V, Vgs=0V		60	105	160	mA
Gm	Transconductance Vds=3V, Vgs=0V		45	60		mS
Vp	Pinch-off Voltage Vds=3V, Ids=1.0 mA			-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)			105		°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	135mA
Igsf	Forward Gate Current	10mA	2mA
Pin	Input Power	22dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	Total Power Dissipation	1.3W	1.1W

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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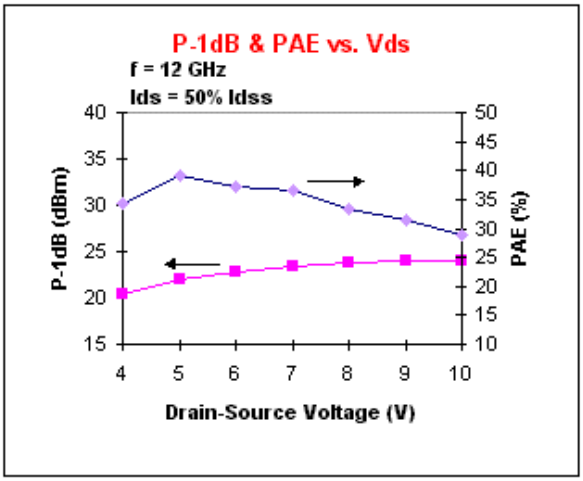

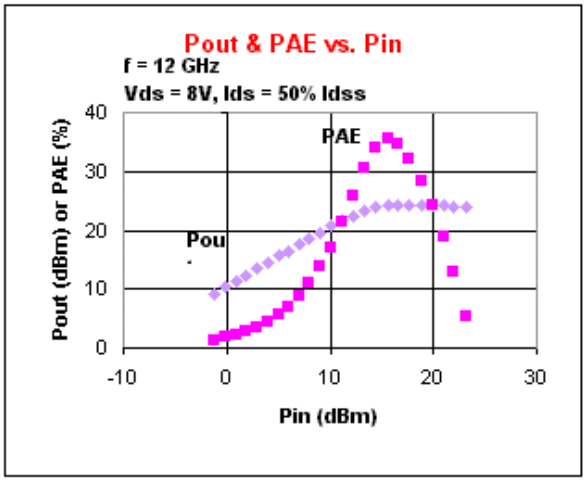

S-PARAMETERS

8V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.989	-21.4	4.677	163.5	0.019	78.1	0.665	-7.4
2.0	0.970	-41.5	4.457	149.3	0.036	67.0	0.646	-15.3
3.0	0.942	-60.3	4.164	135.7	0.049	56.3	0.615	-22.4
4.0	0.915	-77.6	3.845	123.2	0.060	47.3	0.584	-29.1
5.0	0.888	-94.0	3.529	111.1	0.068	38.6	0.550	-36.2
6.0	0.870	-107.0	3.204	100.9	0.072	32.1	0.526	-42.3
7.0	0.856	-118.1	2.914	91.6	0.075	27.0	0.508	-48.4
8.0	0.846	-127.2	2.663	83.2	0.077	21.2	0.496	-54.3
9.0	0.840	-135.1	2.442	75.5	0.078	16.6	0.487	-60.1
10.0	0.834	-142.0	2.258	68.4	0.077	13.1	0.482	-65.4
11.0	0.833	-148.6	2.115	61.5	0.078	10.0	0.478	-70.9
12.0	0.829	-154.2	1.985	54.8	0.078	6.9	0.476	-76.3
13.0	0.828	-160.2	1.880	48.1	0.078	3.7	0.471	-81.7
14.0	0.826	-166.5	1.799	41.4	0.079	1.1	0.465	-86.7
15.0	0.823	-173.0	1.721	34.6	0.079	-1.5	0.457	-92.5
16.0	0.824	180.0	1.652	27.4	0.080	-4.8	0.446	-98.7
17.0	0.823	172.7	1.583	19.9	0.082	-7.8	0.434	-106.0
18.0	0.822	165.6	1.510	12.5	0.082	-10.9	0.422	-114.2
19.0	0.824	159.0	1.436	5.0	0.082	-13.6	0.412	-123.8
20.0	0.827	153.0	1.358	-2.3	0.083	-16.4	0.409	-134.1
21.0	0.845	151.3	1.218	-8.6	0.078	-18.8	0.445	-148.8
22.0	0.853	148.1	1.144	-14.9	0.076	-20.1	0.467	-158.9
23.0	0.859	145.0	1.073	-20.7	0.076	-19.7	0.496	-166.3
24.0	0.862	143.0	1.012	-26.4	0.073	-20.1	0.533	-173.2
25.0	0.870	141.1	0.965	-31.9	0.074	-18.3	0.565	-179.5
26.0	0.866	139.5	0.915	-36.9	0.074	-17.5	0.595	176.0

Note: The data included 0.7 mils diameter Au bonding wires:
1 gate wires, 15 mils each; 1 drain wires, 20 mils each; 4 source wires, 7 mils each.