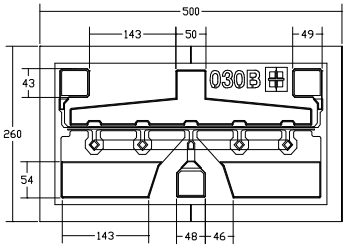
Excelics EPA030B

PRELIMINARY DATA SHEET

High Performance Heterojunction Dual-Gate FET

- **+18.0dBm TYPICAL OUTPUT POWER**
- **19.5dB TYPICAL POWER GAIN AT 12GHz**
- **0.3 X 300 MICRON RECESSED "MUSHROOM" DUAL GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL DOPING PROFILE PROVIDES EXTRA HIGH PERFORMANCE AND HIGH RELIABILITY**
- **MIXER, SWITCH, AGC AND TEMPERATURE COMPENSATION APPLICATIONS**
- **Idss SORTED IN 5mA PER BIN RANGE**



Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS (T_a = 25 ^{O}C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression Vds=6V, Ids=50% Idss, Vg2s=0V f=12GHz	15.0	18.0		dBm
G_{1dB}	Gain at 1dB Compression Vds=6V, Ids=50% Idss, Vg2s=0V f=12GHz	17.5	19.5		dB
NF	Noise Figure Vds=3V, Ids=15mA, Vg2s=0V f=12GHz		1.2		dB
Ga	Associated Gain Vds=3V, Ids=15mA, Vg2s=0V f=12GHz		17.5		dB
Idss	Saturated Drain Current Vds=3V, Vg1s=Vg2s=0V	30	80	115	mA
Gm	Transconductance Vds=3V, Vg1s=-0.5V, Vg2s=0V	40	70		mS
Vp1	Pinch-off Voltage Vds=3V, Ids=1.0mA, Vg2s=0V		-1.5	-3.5	V
Vp2	Pinch-off Voltage Vds=3V, Ids=1.0mA, Vg1s=0V		-1.5	-3.5	V
BVg2d	Gate 2 to Drain Breakdown Voltage Ig2d=1.0mA, Gate 1 Open	-10	-14		V
BVg1s	Gate 1 to Source Breakdown Voltage Ig1s=1.0mA, Gate 2 Open	-6	-12		V
Rth	Thermal Resistance (Au-Sn Eutectic Attach)		125		^{o}C/W

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MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	10V	7V
Vgs	Gate-Source Voltage	-6V	-3.5V
Ids	Drain Current	Idss	Idss
Igsf	Forward Gate Current	15mA	2.5mA
Pin	Input Power	15dBm	@3dB Compression
Tch	Channel Temperature	175°C	150°C
Tstg	Storage Temperature	-65/175°C	-65/150°C
Pt	Total Power Dissipation	1.1W	900mW

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.

S-PARAMETERS
6V, 1/2 Idss, Vg2s=0V

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.987	-15.5	9.119	165.4	0.006	84.4	0.941	-6.4
2.0	0.972	-30.0	8.833	152.3	0.011	67.5	0.930	-12.8
3.0	0.943	-43.4	8.447	140.3	0.015	63.7	0.915	-18.5
4.0	0.917	-56.0	8.042	128.6	0.019	55.8	0.901	-23.4
5.0	0.871	-70.3	7.817	116.2	0.021	47.0	0.878	-28.6
6.0	0.837	-81.6	7.430	106.1	0.023	42.9	0.866	-32.0
7.0	0.811	-93.0	7.126	96.2	0.024	39.3	0.853	-35.5
8.0	0.783	-104.6	6.898	86.4	0.025	32.1	0.839	-38.9
9.0	0.761	-116.8	6.662	76.4	0.024	25.0	0.825	-42.7
10.0	0.741	-128.5	6.456	66.4	0.023	21.8	0.814	-46.8
11.0	0.739	-140.3	6.281	56.1	0.022	16.8	0.813	-51.9
12.0	0.740	-151.2	6.090	45.8	0.020	11.3	0.812	-57.7
13.0	0.748	-161.4	5.883	35.3	0.019	6.5	0.820	-64.8
14.0	0.763	-170.1	5.692	24.9	0.016	6.1	0.840	-72.3
15.0	0.783	-177.9	5.515	14.0	0.014	9.1	0.875	-81.1
16.0	0.798	175.1	5.279	3.1	0.013	12.5	0.919	-89.6
17.0	0.812	169.0	5.034	-7.4	0.013	17.8	0.958	-97.7
18.0	0.825	163.0	4.866	-17.4	0.012	26.4	1.002	-104.2
19.0	0.835	157.3	4.776	-27.7	0.014	37.8	1.050	-111.0
20.0	0.851	151.7	4.733	-37.8	0.014	48.1	1.105	-117.5
21.0	0.869	142.8	4.727	-49.2	0.018	55.4	1.148	-122.2
22.0	0.895	135.8	4.661	-61.4	0.023	62.6	1.215	-130.0
23.0	0.919	129.8	4.615	-74.5	0.030	64.6	1.285	-140.4
24.0	0.944	125.5	4.605	-89.6	0.039	62.3	1.361	-155.4
25.0	0.978	122.1	4.514	-107.3	0.048	54.1	1.434	-174.8
26.0	0.994	117.6	4.183	-125.4	0.058	45.7	1.479	167.2
27.0	1.005	110.7	3.649	-142.2	0.062	36.6	1.470	153.0
28.0	1.014	103.8	3.103	-158.4	0.064	26.7	1.411	141.6
29.0	1.023	100.4	2.569	-172.7	0.064	20.3	1.351	130.4
30.0	1.016	99.6	2.115	175.2	0.059	16.0	1.281	121.0
31.0	1.009	97.6	1.753	164.4	0.055	13.4	1.216	116.1
32.0	1.024	96.3	1.492	154.4	0.052	11.3	1.169	112.4
33.0	1.038	98.6	1.278	145.0	0.050	8.8	1.106	106.4
34.0	1.060	102.3	1.131	136.8	0.050	7.3	1.068	100.4
35.0	1.066	103.0	1.009	129.3	0.052	4.4	1.070	98.1
36.0	1.064	98.7	0.924	121.4	0.051	-4.2	1.061	101.0
37.0	1.071	92.6	0.858	112.7	0.052	-17.4	1.034	102.7
38.0	1.087	90.5	0.810	103.2	0.048	-31.0	0.998	100.6
39.0	1.076	89.4	0.764	93.2	0.050	-45.2	0.990	95.1
40.0	1.047	84.1	0.700	81.9	0.044	-59.4	0.978	93.2

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., 2 gate2 wires(to ground), 7 mils each