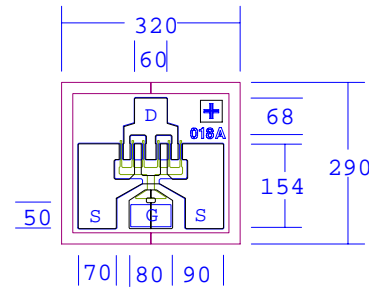


DATA SHEET
High Efficiency Heterojunction Power FET

- **VERY HIGH f_{max} : 120GHz**
- **+20.0dBm TYPICAL OUTPUT POWER**
- **13.0dB TYPICAL POWER GAIN AT 18 GHz**
- **TYPICAL 0.75dB NOISE FIGURE AND 12.5dB ASSOCIATED GAIN AT 12GHz**
- **0.3 X 180 MICRON RECESSED “MUSHROOM” GATE**
- **Si₃N₄ PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY**
- **Idss SORTED IN 5 mA PER BIN RANGE**



Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

SYMBOLS	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression	f=12GHz V _{ds} =6V, I _{ds} =50% Idss	18.0	20.0*		dBm
G_{1dB}	Gain at 1dB Compression	f=12GHz V _{ds} =6V, I _{ds} =50% Idss	13.0	14.5 13.0		dB
PAE	Power Added Efficiency at 1dB Compression	V _{ds} =6V, I _{ds} =50% Idss f=12GHz		48		%
NF	Noise Figure	V _{ds} =2V, I _{ds} =15mA f=12GHz		0.75		dB
G_a	Associated Gain	V _{ds} =2V, I _{ds} =15mA f=12GHz		12.5		dB
I_{dss}	Saturated Drain Current	V _{ds} =3V, V _{gs} =0V	30	55	80	mA
G_m	Transconductance	V _{ds} =3V, V _{gs} =0V	35	60		mS
V_p	Pinch-off Voltage	V _{ds} =3V, I _{ds} =1.0mA		-1.0	-2.5	V
BV_{gd}	Drain Breakdown Voltage	I _{gd} =0.5mA	-9	-15		V
BV_{gs}	Source Breakdown Voltage	I _{gs} =0.5mA	-7	-14		V
R_{th}	Thermal Resistance (Au-Sn Eutectic Attach)			185		°C/W

* P_{1dB} = 21.5dBm can be obtained with 8v/50% Idss bias. Consult factory for wafer selection.

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE ¹	CONTINUOUS ²
V_{ds}	Drain-Source Voltage	12V	6V
V_{gs}	Gate-Source Voltage	-8V	-3V
I_{ds}	Drain Current	I _{dss}	I _{dss}
I_{gsf}	Forward Gate Current	9mA	1.5mA
P_{in}	Input Power	16dBm	@3dB Compression
T_{ch}	Channel Temperature	175°C	150°C
T_{stg}	Storage Temperature	-65/175°C	-65/150°C
P_t	Total Power Dissipation	740mW	625mW

Note: 1. Exceeding any of the above ratings may result in permanent damage.

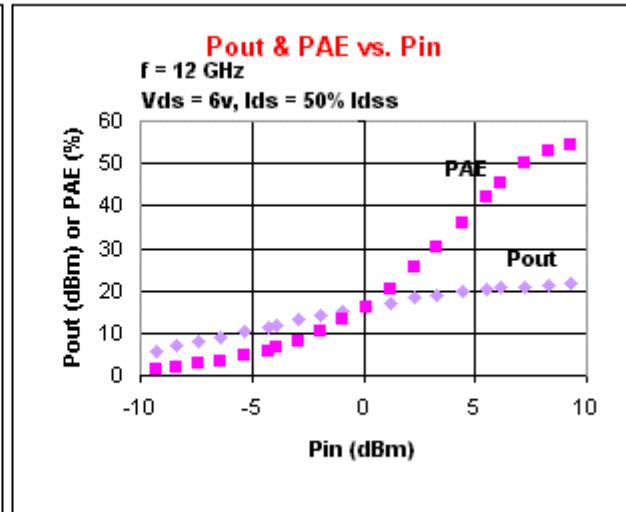
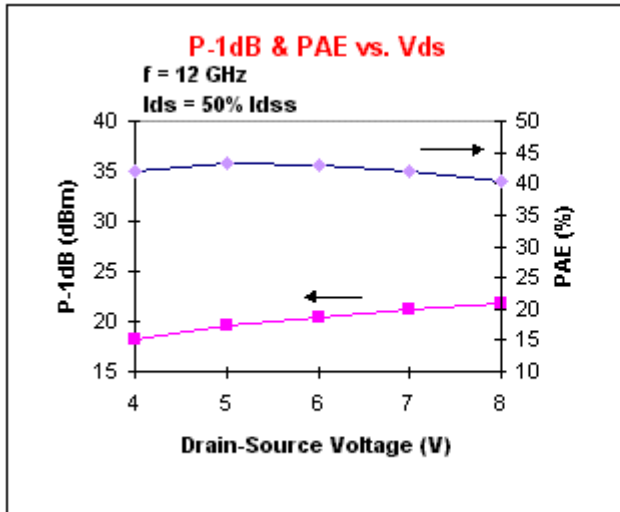
2. Exceeding any of the above ratings may reduce MTTF below design goals.

Excelics Semiconductor, Inc., 2908 Scott Blvd., Santa Clara, CA 95054

Phone: (408) 970-8664 Fax: (408) 970-8998 Web Site: www.excelics.com

DATA SHEET

High Efficiency Heterojunction Power FET



S-PARAMETERS

6V, 1/2 Idss

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.980	-13.0	4.681	169.2	0.010	77.2	0.837	-3.5
2.0	0.969	-25.7	4.581	160.2	0.020	71.8	0.830	-7.2
3.0	0.953	-38.3	4.476	151.2	0.030	67.3	0.819	-10.8
4.0	0.933	-50.7	4.339	142.0	0.037	61.9	0.803	-14.8
5.0	0.908	-63.2	4.206	132.9	0.044	54.3	0.783	-18.9
6.0	0.888	-74.6	4.017	124.3	0.050	48.5	0.765	-22.7
7.0	0.868	-84.9	3.825	116.2	0.054	42.9	0.748	-26.8
8.0	0.850	-94.8	3.635	108.5	0.058	37.9	0.734	-30.6
9.0	0.833	-103.7	3.440	101.2	0.061	32.3	0.720	-34.4
10.0	0.815	-111.8	3.260	94.4	0.062	28.2	0.708	-37.7
11.0	0.807	-119.7	3.108	87.9	0.065	23.9	0.700	-41.1
12.0	0.793	-127.2	2.963	81.8	0.066	20.3	0.691	-43.8
13.0	0.785	-135.1	2.852	75.6	0.067	16.4	0.683	-46.4
14.0	0.775	-143.2	2.749	69.6	0.069	12.9	0.676	-48.4
15.0	0.768	-151.8	2.663	63.4	0.070	9.5	0.664	-50.6
16.0	0.763	-161.0	2.585	57.1	0.071	6.7	0.655	-52.6
17.0	0.762	-170.3	2.515	50.6	0.074	3.4	0.641	-54.7
18.0	0.757	-180.0	2.423	44.1	0.076	0.2	0.626	-56.7
19.0	0.765	-170.4	2.341	37.4	0.079	-2.4	0.604	-59.5
20.0	0.767	-162.2	2.254	30.8	0.081	-6.3	0.587	-63.0
21.0	0.780	-155.3	2.138	24.4	0.080	-8.7	0.563	-69.3
22.0	0.791	-148.7	2.031	18.3	0.081	-12.2	0.547	-74.8
23.0	0.795	-143.4	1.918	12.1	0.080	-14.7	0.541	-81.1
24.0	0.804	-138.9	1.824	6.4	0.079	-15.9	0.543	-87.9
25.0	0.811	-136.3	1.743	1.5	0.078	-16.3	0.553	-94.0
26.0	0.807	-134.9	1.676	-3.1	0.077	-17.8	0.564	-100.7
27.0	0.817	-133.7	1.603	-7.8	0.076	-17.2	0.580	-106.7
28.0	0.816	-131.8	1.544	-12.8	0.078	-16.7	0.592	-113.0
29.0	0.806	-130.5	1.520	-17.2	0.078	-16.7	0.611	-117.6
30.0	0.804	-128.8	1.494	-22.0	0.079	-17.3	0.618	-123.0
31.0	0.797	-125.3	1.461	-27.2	0.081	-20.4	0.622	-127.6
32.0	0.795	-121.1	1.435	-32.1	0.081	-20.9	0.615	-133.0
33.0	0.785	-115.8	1.388	-38.3	0.080	-25.9	0.609	-138.5
34.0	0.787	-110.2	1.351	-44.9	0.077	-27.8	0.592	-145.1
35.0	0.813	-103.3	1.322	-51.4	0.077	-29.9	0.585	-152.5
36.0	0.830	-97.4	1.263	-58.0	0.078	-34.9	0.578	-160.7
37.0	0.865	-88.9	1.218	-65.3	0.076	-38.4	0.587	-170.1
38.0	0.886	-84.5	1.144	-72.1	0.079	-43.6	0.599	-178.7
39.0	0.897	-78.4	1.064	-79.8	0.079	-51.9	0.625	-172.4
40.0	0.905	-74.8	0.975	-86.4	0.078	-60.4	0.651	-165.4

S-PARAMETERS

2V, 15mA

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	1.000	-11.0	5.013	170.5	0.017	79.9	0.631	-6.1
2.0	0.990	-21.5	4.947	162.8	0.032	73.8	0.622	-12.6
3.0	0.976	-32.1	4.862	154.8	0.047	69.2	0.609	-19.0
4.0	0.962	-42.6	4.759	146.8	0.061	62.5	0.590	-25.7
5.0	0.941	-53.4	4.643	138.3	0.073	56.0	0.558	-33.1
6.0	0.922	-63.6	4.479	130.6	0.084	49.9	0.535	-39.9
7.0	0.905	-73.1	4.298	123.1	0.094	43.9	0.511	-46.9
8.0	0.883	-82.0	4.112	116.0	0.103	38.2	0.490	-53.5
9.0	0.864	-90.4	3.938	109.3	0.108	32.9	0.469	-60.0
10.0	0.846	-97.9	3.753	103.1	0.114	27.6	0.450	-65.4
11.0	0.829	-105.3	3.615	97.0	0.120	23.1	0.436	-70.8
12.0	0.819	-112.4	3.472	91.3	0.124	18.8	0.422	-75.4
13.0	0.804	-120.0	3.360	85.4	0.130	14.1	0.400	-80.2
14.0	0.792	-128.0	3.274	79.7	0.134	9.6	0.379	-84.5
15.0	0.784	-136.3	3.181	74.0	0.139	5.0	0.357	-89.3
16.0	0.777	-145.0	3.116	67.7	0.144	0.6	0.330	-95.2
17.0	0.770	-155.2	3.019	61.0	0.148	-4.3	0.297	-102.0
18.0	0.773	-165.3	2.932	54.4	0.153	-9.5	0.260	-111.1
19.0	0.770	-175.2	2.813	47.7	0.155	-14.3	0.226	-121.2
20.0	0.771	-175.3	2.696	41.0	0.156	-18.8	0.201	-135.4
21.0	0.780	-169.2	2.466	35.3	0.150	-22.9	0.204	-156.1
22.0	0.777	-163.2	2.327	30.2	0.149	-26.0	0.209	-168.6
23.0	0.793	-157.9	2.206	25.0	0.147	-29.1	0.225	-177.7
24.0	0.789	-154.9	2.096	20.6	0.145	-31.6	0.240	-176.0
25.0	0.796	-151.5	2.025	16.6	0.144	-34.3	0.260	-172.7
26.0	0.804	-149.6	1.928	12.1	0.145	-36.0	0.272	-169.4
27.0	0.786	-147.6	1.868	8.6	0.142	-37.7	0.282	-168.5
28.0	0.788	-146.0	1.811	5.0	0.143	-39.3	0.287	-166.7
29.0	0.779	-144.4	1.790	1.1	0.143	-41.4	0.293	-164.7
30.0	0.777	-140.9	1.758	-3.4	0.145	-44.5	0.294	-162.2
31.0	0.769	-137.1	1.723	-7.6	0.145	-46.8	0.292	-157.2
32.0	0.770	-131.7	1.683	-12.6	0.145	-51.5	0.290	-151.7
33.0	0.758	-126.2	1.606	-17.8	0.142	-55.4	0.287	-143.1
34.0	0.764	-120.0	1.541	-22.6	0.140	-61.1	0.293	-134.7
35.0	0.777	-114.3	1.497	-27.1	0.136	-64.6	0.311	-122.2
36.0	0.799	-107.4	1.414	-31.6	0.134	-70.1	0.345	-114.2
37.0	0.824	-101.9	1.339	-37.1	0.134	-75.6	0.384	-104.6
38.0	0.856	-97.2	1.277	-41.9	0.130	-82.7	0.431	-98.0
39.0	0.877	-92.4	1.196	-47.5	0.126	-87.6	0.478	-93.3
40.0	0.884	-89.0	1.100	-52.6	0.123	-92.6	0.517	-91.0

Note: The data included 0.7 mils diameter Au bonding wires:
 1 gate wire, 15 mils each; 1 drain wire, 20 mils each; 6 source wires, 8 mils each.