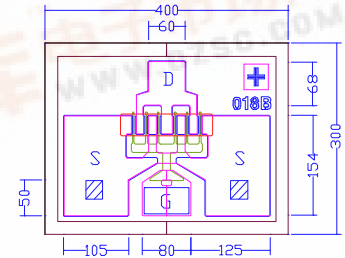


DATA SHEET

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
- Si_3N_4 PASSIVATION AND VIA HOLE GROUNDING
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY
- I_{dss} SORTED IN 5 mA PER BIN RANGE



☐: Via Hole
Chip Thickness: 75 ± 13 microns
All Dimensions In Microns

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

SYMBOLS	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression $V_{ds}=6V, I_{ds}=50\% I_{dss}$	$f=12GHz$ $f=18GHz$	18.0	20.0* 20.0*		dBm
G_{1dB}	Gain at 1dB Compression $V_{ds}=6V, I_{ds}=50\% I_{dss}$	$f=12GHz$ $f=18GHz$	13.0	14.5 13.0		dB
PAE	Power Added Efficiency at 1dB Compression $V_{ds}=6V, I_{ds}=50\% I_{dss}$	$f=12GHz$		48		%
NF	Noise Figure $V_{ds}=2V, I_{ds}=15mA$	$f=12GHz$		0.75		dB
Ga	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
Gm	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
Rth	Thermal Resistance (Au-Sn Eutectic Attach)			140		$^\circ C/W$

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

MAXIMUM RATINGS AT $25^\circ C$

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
Pin	Input Power	16dBm	@3dB Compression
Tch	Channel Temperature	175 $^\circ C$	150 $^\circ C$
Tstg	Storage Temperature	-65/175 $^\circ C$	-65/150 $^\circ C$
Pt	Total Power Dissipation	950mW	800mW

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.

EPA018BV

DATA SHEET

High Efficiency Heterojunction Power FET

S-PARAMETERS

2V, 15mA

FREQ (GHz)	--- S11 --- MAG	ANG	--- S21 --- MAG	ANG	--- S12 --- MAG	ANG	--- S22 --- MAG	ANG
1.0	0.985	-12.3	5.362	169.7	0.017	82.3	0.710	-5.8
2.0	0.979	-24.4	5.277	161.4	0.034	75.5	0.702	-11.8
3.0	0.964	-36.4	5.158	152.7	0.048	67.6	0.683	-17.8
4.0	0.957	-48.5	5.038	144.1	0.063	60.7	0.661	-23.8
5.0	0.933	-60.2	4.943	136.1	0.076	54.2	0.644	-30.3
6.0	0.920	-69.9	4.746	128.3	0.087	47.8	0.613	-36.1
7.0	0.915	-79.1	4.563	120.7	0.097	41.7	0.573	-41.5
8.0	0.902	-87.1	4.374	113.6	0.105	35.9	0.527	-47.8
9.0	0.892	-95.4	4.198	106.2	0.112	29.3	0.478	-54.7
10.0	0.864	-104.9	4.040	98.6	0.119	22.8	0.430	-63.5
11.0	0.843	-115.7	3.858	90.8	0.123	16.3	0.391	-72.2
12.0	0.825	-127.6	3.643	83.1	0.126	9.6	0.354	-79.8
13.0	0.822	-138.3	3.408	75.7	0.128	3.8	0.318	-86.2
14.0	0.808	-147.8	3.179	68.9	0.127	-2.5	0.288	-93.9
15.0	0.806	-158.2	2.984	62.4	0.127	-7.5	0.273	-99.4
16.0	0.808	-168.9	2.805	56.0	0.125	-12.4	0.263	-102.7
17.0	0.814	-178.1	2.619	50.2	0.125	-16.3	0.248	-102.3
18.0	0.823	175.9	2.490	44.9	0.126	-20.0	0.221	-105.1
19.0	0.809	170.2	2.415	40.0	0.129	-23.5	0.202	-108.8
20.0	0.806	162.6	2.375	33.9	0.134	-27.8	0.183	-115.1
21.0	0.792	169.1	2.314	31.0	0.138	-29.0	0.137	-146.1
22.0	0.813	163.4	2.207	25.5	0.137	-33.0	0.131	-169.8
23.0	0.788	160.3	2.085	20.2	0.136	-36.6	0.153	171.0
24.0	0.787	153.7	1.994	14.3	0.135	-40.8	0.192	156.4
25.0	0.774	147.2	1.877	8.4	0.131	-44.9	0.227	151.5
26.0	0.789	139.7	1.749	3.0	0.126	-49.3	0.240	144.9
27.0	0.798	138.7	1.635	-1.5	0.121	-51.6	0.251	137.6
28.0	0.817	136.4	1.524	-6.3	0.117	-54.5	0.272	128.0
29.0	0.823	136.5	1.447	-11.0	0.113	-57.6	0.308	121.7
30.0	0.814	133.7	1.363	-15.6	0.110	-62.0	0.335	116.4
31.0	0.819	131.4	1.279	-19.6	0.104	-65.3	0.359	114.8
32.0	0.807	128.7	1.206	-23.7	0.100	-68.4	0.375	113.1
33.0	0.817	126.1	1.153	-27.3	0.099	-71.5	0.390	113.0
34.0	0.815	122.9	1.096	-30.3	0.098	-74.7	0.402	111.5
35.0	0.838	120.4	1.054	-33.2	0.095	-79.5	0.423	112.2
36.0	0.828	118.5	1.026	-36.7	0.099	-82.1	0.437	109.7
37.0	0.854	113.2	1.016	-40.4	0.103	-88.7	0.463	107.9
38.0	0.843	111.0	0.983	-44.8	0.108	-93.4	0.474	102.8
39.0	0.861	109.2	0.958	-49.2	0.113	-99.1	0.497	98.0
40.0	0.848	109.9	0.921	-54.1	0.114	-105.4	0.527	89.5

S-PARAMETERS

6V, 1/2 Idss

FREQ (GHz)	--- S11 --- MAG	ANG	--- S21 --- MAG	ANG	--- S12 --- MAG	ANG	--- S22 --- MAG	ANG
1	0.984	-14.6	5.256	168.2	0.012	78.66	0.836	-3.94
2	0.975	-28.9	5.134	158.5	0.021	74.5	0.828	-7.92
3	0.952	-42.8	4.956	148.7	0.031	66.46	0.813	-11.8
4	0.938	-56.6	4.783	139	0.039	59.32	0.795	-15.5
5	0.911	-70.2	4.638	129.8	0.047	52.76	0.777	-19.5
6	0.891	-80.8	4.374	121.6	0.053	46.88	0.755	-23
7	0.882	-90.5	4.142	113.8	0.057	41.16	0.731	-26.3
8	0.866	-98.7	3.931	106.7	0.061	35.57	0.702	-30.2
9	0.856	-107	3.751	99.4	0.065	30.97	0.671	-34.3
10	0.831	-116	3.596	91.83	0.068	24.54	0.638	-39.1
11	0.817	-127	3.428	83.74	0.07	18.87	0.613	-43.8
12	0.806	-138	3.214	75.82	0.07	13.05	0.589	-47.8
13	0.81	-148	2.992	68.49	0.07	8.4	0.57	-51.2
14	0.802	-157	2.794	61.66	0.069	2.96	0.551	-55.3
15	0.807	-167	2.614	55.19	0.069	-0.85	0.544	-58.5
16	0.81	-177	2.439	48.26	0.068	-3.99	0.543	-60.5
17	0.818	174.2	2.264	42.45	0.067	-6.76	0.547	-60.9
18	0.823	168.7	2.144	37.22	0.069	-9.38	0.536	-62
19	0.809	163.2	2.082	32.49	0.072	-11.2	0.533	-63.7
20	0.805	155.7	2.052	26.57	0.075	-13.6	0.525	-65.5
21	0.791	163	2.07	24.17	0.081	-13.6	0.471	-74.5
22	0.818	158	2.01	18.33	0.082	-17.4	0.439	-80.4
23	0.796	155.5	1.933	12.63	0.083	-19.6	0.415	-90.3
24	0.804	149	1.883	5.46	0.085	-22.8	0.392	-102
25	0.789	143	1.777	-1.34	0.083	-26.6	0.393	-113
26	0.817	136	1.665	-7.64	0.083	-30.4	0.387	-121
27	0.831	135	1.578	-12.8	0.078	-30.7	0.381	-129
28	0.842	133.2	1.477	-18.7	0.077	-32.9	0.369	-141
29	0.854	133.3	1.417	-24.7	0.075	-36.3	0.379	-155
30	0.845	130.6	1.342	-30.7	0.072	-38.4	0.394	-167
31	0.844	128.2	1.256	-36.4	0.071	-41.7	0.424	-176
32	0.836	125.4	1.176	-41.5	0.067	-46.1	0.441	177.8
33	0.847	123.2	1.115	-46.2	0.065	-50.1	0.465	172.9
34	0.844	120.1	1.06	-50.5	0.063	-53.6	0.483	168.6
35	0.87	117.6	1.011	-54.7	0.062	-55.9	0.51	165.4
36	0.862	115.5	0.981	-58.9	0.063	-60.3	0.521	161
37	0.889	110	0.97	-64	0.066	-64.1	0.547	157.5
38	0.872	107.6	0.937	-69	0.07	-70.2	0.557	151.7
39	0.886	105.5	0.917	-74.7	0.075	-75.9	0.576	143.4
40	0.876	106.2	0.892	-81.4	0.084	-86.4	0.592	131.2

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