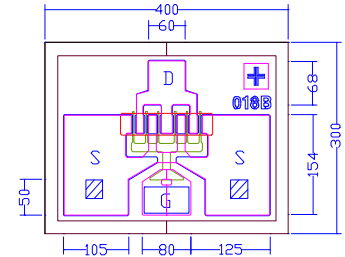



DATA SHEET
High Efficiency Heterojunction Power FET

- **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 $V_{ds}=6V, I_{ds}=50\% I_{dss}$		$f=12GHz$ 18.0 $f=18GHz$ 20.0* 20.0*		dBm
G_{1dB}	Gain at 1dB Compression $V_{ds}=6V, I_{ds}=50\% I_{dss}$		$f=12GHz$ 13.0 $f=18GHz$ 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
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)		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
P_{in}	Input Power	16dBm	@ 3dB Compression
T_{ch}	Channel Temperature	175 $^\circ C$	150 $^\circ C$
T_{stg}	Storage Temperature	-65/175 $^\circ C$	-65/150 $^\circ C$
P_t	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.

DATA SHEET

High Efficiency Heterojunction Power FET

S-PARAMETERS

2V, 15mA

S-PARAMETERS

6V, 1/2 Idss

2V, 15mA									6V, 1/2 Idss								
FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---		FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.985	-12.3	5.362	169.7	0.017	82.3	0.710	-5.8	1	0.984	-14.6	5.256	168.2	0.012	78.66	0.836	-3.94
2.0	0.979	-24.4	5.277	161.4	0.034	75.5	0.702	-11.8	2	0.975	-28.9	5.134	158.5	0.021	74.5	0.828	-7.92
3.0	0.964	-36.4	5.158	152.7	0.048	67.6	0.683	-17.8	3	0.952	-42.8	4.956	148.7	0.031	66.46	0.813	-11.8
4.0	0.957	-48.5	5.038	144.1	0.063	60.7	0.661	-23.8	4	0.938	-56.6	4.783	139	0.039	59.32	0.795	-15.5
5.0	0.933	-60.2	4.943	136.1	0.076	54.2	0.644	-30.3	5	0.911	-70.2	4.638	129.8	0.047	52.76	0.777	-19.5
6.0	0.920	-69.9	4.746	128.3	0.087	47.8	0.613	-36.1	6	0.891	-80.8	4.374	121.6	0.053	46.88	0.755	-23
7.0	0.915	-79.1	4.563	120.7	0.097	41.7	0.573	-41.5	7	0.882	-90.5	4.142	113.8	0.057	41.16	0.731	-26.3
8.0	0.902	-87.1	4.374	113.6	0.105	35.9	0.527	-47.8	8	0.866	-98.7	3.931	106.7	0.061	35.57	0.702	-30.2
9.0	0.892	-95.4	4.198	106.2	0.112	29.3	0.478	-54.7	9	0.856	-107	3.751	99.4	0.065	30.97	0.671	-34.3
10.0	0.864	-104.9	4.040	98.6	0.119	22.8	0.430	-63.5	10	0.831	-116	3.596	91.83	0.068	24.54	0.638	-39.1
11.0	0.843	-115.7	3.858	90.8	0.123	16.3	0.391	-72.2	11	0.817	-127	3.428	83.74	0.07	18.87	0.613	-43.8
12.0	0.825	-127.6	3.643	83.1	0.126	9.6	0.354	-79.8	12	0.806	-138	3.214	75.82	0.07	13.05	0.589	-47.8
13.0	0.822	-138.3	3.408	75.7	0.128	3.8	0.318	-86.2	13	0.81	-148	2.992	68.49	0.07	8.4	0.57	-51.2
14.0	0.808	-147.8	3.179	68.9	0.127	-2.5	0.288	-93.9	14	0.802	-157	2.794	61.66	0.069	2.96	0.551	-55.3
15.0	0.806	-158.2	2.984	62.4	0.127	-7.5	0.273	-99.4	15	0.807	-167	2.614	55.19	0.069	-0.85	0.544	-58.5
16.0	0.808	-168.9	2.805	56.0	0.125	-12.4	0.263	-102.7	16	0.81	-177	2.439	48.26	0.068	-3.99	0.543	-60.5
17.0	0.814	-178.1	2.619	50.2	0.125	-16.3	0.248	-102.3	17	0.818	174.2	2.264	42.45	0.067	-6.76	0.547	-60.9
18.0	0.823	175.9	2.490	44.9	0.126	-20.0	0.221	-105.1	18	0.823	168.7	2.144	37.22	0.069	-9.38	0.536	-62
19.0	0.809	170.2	2.415	40.0	0.129	-23.5	0.202	-108.8	19	0.809	163.2	2.082	32.49	0.072	-11.2	0.533	-63.7
20.0	0.806	162.6	2.375	33.9	0.134	-27.8	0.183	-115.1	20	0.805	155.7	2.052	26.57	0.075	-13.6	0.525	-65.5
21.0	0.792	169.1	2.314	31.0	0.138	-29.0	0.137	-146.1	21	0.791	163	2.07	24.17	0.081	-13.6	0.471	-74.5
22.0	0.813	163.4	2.207	25.5	0.137	-33.0	0.131	-169.8	22	0.818	158	2.01	18.33	0.082	-17.4	0.439	-80.4
23.0	0.788	160.3	2.085	20.2	0.136	-36.6	0.153	171.0	23	0.796	155.5	1.933	12.63	0.083	-19.6	0.415	-90.3
24.0	0.787	153.7	1.994	14.3	0.135	-40.8	0.192	156.4	24	0.804	149	1.883	5.46	0.085	-22.8	0.392	-102
25.0	0.774	147.2	1.877	8.4	0.131	-44.9	0.227	151.5	25	0.789	143	1.777	-1.34	0.083	-26.6	0.393	-113
26.0	0.789	139.7	1.749	3.0	0.126	-49.3	0.240	144.9	26	0.817	136	1.665	-7.64	0.083	-30.4	0.387	-121
27.0	0.798	138.7	1.635	-1.5	0.121	-51.6	0.251	137.6	27	0.831	135	1.578	-12.8	0.078	-30.7	0.381	-129
28.0	0.817	136.4	1.524	-6.3	0.117	-54.5	0.272	128.0	28	0.842	133.2	1.477	-18.7	0.077	-32.9	0.369	-141
29.0	0.823	136.5	1.447	-11.0	0.113	-57.6	0.308	121.7	29	0.854	133.3	1.417	-24.7	0.075	-36.3	0.379	-155
30.0	0.814	133.7	1.363	-15.6	0.110	-62.0	0.335	116.4	30	0.845	130.6	1.342	-30.7	0.072	-38.4	0.394	-167
31.0	0.819	131.4	1.279	-19.6	0.104	-65.3	0.359	114.8	31	0.844	128.2	1.256	-36.4	0.071	-41.7	0.424	-176
32.0	0.807	128.7	1.206	-23.7	0.100	-68.4	0.375	113.1	32	0.836	125.4	1.176	-41.5	0.067	-46.1	0.441	177.8
33.0	0.817	126.1	1.153	-27.3	0.099	-71.5	0.390	113.0	33	0.847	123.2	1.115	-46.2	0.065	-50.1	0.465	172.9
34.0	0.815	122.9	1.096	-30.3	0.098	-74.7	0.402	111.5	34	0.844	120.1	1.06	-50.5	0.063	-53.6	0.483	168.6
35.0	0.838	120.4	1.054	-33.2	0.095	-79.5	0.423	112.2	35	0.87	117.6	1.011	-54.7	0.062	-55.9	0.51	165.4
36.0	0.828	118.5	1.026	-36.7	0.099	-82.1	0.437	109.7	36	0.862	115.5	0.981	-58.9	0.063	-60.3	0.521	161
37.0	0.854	113.2	1.016	-40.4	0.103	-88.7	0.463	107.9	37	0.889	110	0.97	-64	0.066	-64.1	0.547	157.5
38.0	0.843	111.0	0.983	-44.8	0.108	-93.4	0.474	102.8	38	0.872	107.6	0.937	-69	0.07	-70.2	0.557	151.7
39.0	0.861	109.2	0.958	-49.2	0.113	-99.1	0.497	98.0	39	0.886	105.5	0.917	-74.7	0.075	-75.9	0.576	143.4
40.0	0.848	109.9	0.921	-54.1	0.114	-105.4	0.527	89.5	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.