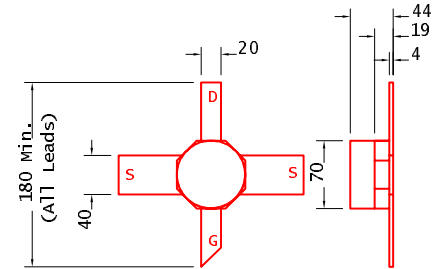


**DATA SHEET**
**High Efficiency Heterojunction Power FET**

- **NON-HERMETIC LOW COST CERAMIC 70mil PACKAGE**
- **+21.5dBm TYPICAL OUTPUT POWER**
- **8.0dB TYPICAL POWER GAIN AT 18GHz**
- **TYPICAL 0.85dB NOISE FIGURE AND 11.0dB ASSOCIATED GAIN AT 12GHz**
- **0.3 X 250 MICRON RECESSED “MUSHROOM” GATE**
- **Si<sub>3</sub>N<sub>4</sub> PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY**



All Dimensions In mils.

**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>ds</sub>	f=12GHz	19.5	21.5	dBm
		f=18GHz		21.5	
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>ds</sub>	f=12GHz	9.5	11.0	dB
		f=18GHz		8.0	
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>ds</sub> =6V, I <sub>ds</sub> =50% I <sub>ds</sub>		f=12GHz 47		%
<b>NF</b>	Noise Figure V <sub>ds</sub> =2V, I <sub>ds</sub> =15mA		f=12GHz 0.85		dB
<b>G<sub>a</sub></b>	Associated Gain V <sub>ds</sub> =2V, I <sub>ds</sub> =15mA		f=12GHz 11.0		dB
<b>I<sub>ds</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	40	75	105	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	50	80		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =1.0mA		-1.0	-2.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =1.0mA	-9	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =1.0mA	-6	-14		V
<b>R<sub>th</sub></b>	Thermal Resistance		370*		°C/W

 \* Overall R<sub>th</sub> depends on case mounting.

**MAXIMUM RATINGS AT 25°C**

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
<b>V<sub>ds</sub></b>	Drain-Source Voltage	10V	6V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-6V	-3V
<b>I<sub>ds</sub></b>	Drain Current	I <sub>ds</sub>	50mA
<b>I<sub>gsf</sub></b>	Forward Gate Current	12mA	2mA
<b>P<sub>in</sub></b>	Input Power	18dBm	@ 3dB Compression
<b>T<sub>ch</sub></b>	Channel Temperature	175°C	150°C
<b>T<sub>stg</sub></b>	Storage Temperature	-65/175°C	-65/150°C
<b>P<sub>t</sub></b>	Total Power Dissipation	370mW	310mW

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.

# EPA025A-70

## 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	0.963	-26.2	6.488	155.5	0.015	75.3	0.795	-12.4
2.0	0.886	-51.2	5.91	132.5	0.026	60.1	0.76	-25.4
3.0	0.799	-73.4	5.223	112.3	0.033	49.6	0.729	-37
4.0	0.716	-94.3	4.709	94.4	0.038	44.2	0.707	-45.9
5.0	0.638	-113.8	4.296	77.9	0.042	39.6	0.68	-54.4
6.0	0.579	-129.1	3.913	62.7	0.045	37.7	0.651	-65.5
7.0	0.517	-145.7	3.559	47.9	0.047	34.2	0.637	-76
8.0	0.462	-161.5	3.288	34.4	0.048	33.9	0.619	-84.4
9.0	0.424	172.2	3.097	19.9	0.055	34.3	0.627	-90.9
10.0	0.409	148.3	2.9	4.8	0.064	31	0.623	-102.3
11.0	0.381	134.7	2.794	-9.1	0.074	25.6	0.62	-118
12.0	0.366	115.9	2.692	-23.3	0.086	19.6	0.629	-132.5
13.0	0.429	92.8	2.521	-38.3	0.098	10.5	0.618	-144.4
14.0	0.483	73.8	2.324	-53.1	0.106	0.1	0.612	-157.7
15.0	0.488	56.6	2.209	-69.6	0.115	-12	0.633	-178.6
16.0	0.506	38.2	2.089	-86.7	0.123	-25.8	0.642	160.4
17.0	0.52	26.1	1.874	-99.9	0.124	-33.2	0.607	149.2
18.0	0.559	17.4	1.823	-112.1	0.142	-46.2	0.673	136.7
19.0	0.579	-2.4	1.637	-128.6	0.132	-60.9	0.687	115.8
20.0	0.625	-15.5	1.561	-144.3	0.135	-73.4	0.744	98.8
21.0	0.622	-23.3	1.49	-159.8	0.141	-86.7	0.733	86.7
22.0	0.583	-35.7	1.399	-173.6	0.144	-99.4	0.738	76.6
23.0	0.605	-55.5	1.27	170.1	0.141	-115.7	0.727	58.1
24.0	0.639	-69.2	1.179	152.8	0.144	-132.1	0.73	38.8
25.0	0.571	-84.8	1.157	135.4	0.156	-149.3	0.736	25.1
26.0	0.554	-106.7	1.153	118.9	0.174	-164.6	0.733	13.3

#### S-PARAMETERS

2V, 15mA

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	1.014	-22.6	8.052	156.7	0.030	72.3	0.546	-27.0
2.0	0.927	-42.6	5.927	138.8	0.043	62.6	0.591	-31.6
3.0	0.861	-62.4	5.434	120.8	0.058	49.9	0.564	-45.7
4.0	0.801	-79.1	4.978	104.7	0.069	41.5	0.524	-57.2
5.0	0.736	-95.5	4.683	89.0	0.080	31.5	0.466	-69.3
6.0	0.657	-111.4	4.309	73.9	0.086	22.2	0.437	-84.8
7.0	0.589	-129.0	3.951	60.4	0.091	15.0	0.427	-91.9
8.0	0.549	-148.7	3.736	46.7	0.097	6.7	0.399	-99.8
9.0	0.531	-155.8	3.519	33.3	0.101	-3.0	0.276	-120.8
10.0	0.472	-170.6	3.390	20.1	0.102	-6.0	0.294	-144.1
11.0	0.427	160.9	3.173	6.5	0.106	-14.1	0.330	-145.0
12.0	0.443	138.7	3.007	-6.3	0.107	-21.1	0.291	-146.4
13.0	0.484	128.8	2.870	-20.5	0.114	-29.6	0.254	168.5
14.0	0.443	112.4	2.679	-34.6	0.113	-39.6	0.304	139.3
15.0	0.464	88.7	2.434	-47.9	0.109	-46.4	0.293	145.2
16.0	0.514	66.6	2.344	-61.5	0.110	-54.6	0.255	144.9
17.0	0.532	68.8	2.277	-75.2	0.116	-63.1	0.339	91.6
18.0	0.532	50.3	2.024	-87.9	0.113	-70.5	0.411	89.7
19.0	0.573	35.5	1.955	-98.2	0.118	-80.0	0.347	88.4
20.0	0.634	21.2	1.904	-111.2	0.113	-91.2	0.314	77.2
21.0	0.587	15.3	1.823	-129.0	0.114	-103.3	0.483	47.3
22.0	0.585	7.8	1.672	-139.1	0.110	-110.5	0.529	52.6
23.0	0.628	-10.7	1.658	-153.8	0.117	-124.2	0.375	43.3
24.0	0.642	-26.5	1.611	-172.2	0.120	-140.5	0.404	15.5
25.0	0.572	-40.1	1.491	171.7	0.115	-154.2	0.553	6.6
26.0	0.623	-43.2	1.455	160.9	0.124	-162.8	0.465	5.2

EPA025A-70				
Noise Parameters				
Vds=2V, Ids=15mA				
Freq.	Popt		Nfmin	Rn/50
(GHz)	(MAG)	(ANG)	(dB)	
2	0.73	25	0.37	0.22
4	0.64	55	0.46	0.18
6	0.49	81	0.56	0.14
8	0.42	107	0.64	0.11
10	0.32	135	0.76	0.08
12	0.26	173	0.88	0.08
14	0.28	-156	1.08	0.12
16	0.32	-103	1.31	0.24
18	0.37	-55	1.51	0.37
20	0.44	-25	1.65	0.51
22	0.44	-15	1.88	0.59
24	0.46	25	2.05	0.69
26	0.44	39	2.29	0.49