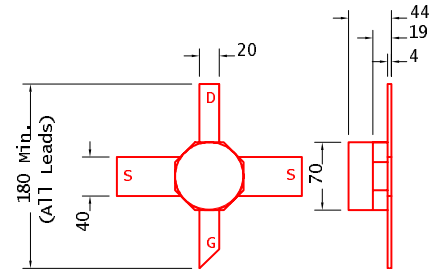


## DATA SHEET Super Low Noise High Gain Heterojunction FET

- NON-HERMETIC LOW COST CERAMIC 70 mil PACKAGE
- TYPICAL 0.50~0.90dB NOISE FIGURE AND 11.5~13.0dB ASSOCIATED GAIN AT 12GHz
- 0.3 X 180 MICRON RECESSED “ MUSHROOM” GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES SUPER LOW NOISE, HIGH GAIN AND HIGH RELIABILITY



All Dimensions In mils.

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

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT	
NF	Noise Figure, f=12GHz V <sub>ds</sub> =2V, I <sub>ds</sub> =15mA	EPB018A5-70		0.50	0.60	dB
		EPB018A7-70		0.65	0.80	
		EPB018A9-70		0.95	1.20	
Ga	Associated Gain, f=12GHz V <sub>ds</sub> =2V, I <sub>ds</sub> =15mA	EPB018A5-70	11.5	13.0		dB
		EPB018A7-70	11.0	12.5		
		EPB018A9-70	10.5	11.5		
P <sub>1dB</sub>	Output Power at 1dB Compression V <sub>ds</sub> =3V, I <sub>ds</sub> =25mA		15.0 15.0		dBm	
G <sub>1dB</sub>	Gain at 1dB Compression V <sub>ds</sub> =3V, I <sub>ds</sub> =25mA		14.0		dB	
			11.5			
I <sub>dss</sub>	Saturated Drain Current V <sub>ds</sub> =2V, V <sub>gs</sub> =0V	15	45	80	mA	
G <sub>m</sub>	Transconductance V <sub>ds</sub> =2V, V <sub>gs</sub> =0V	50	90		mS	
V <sub>p</sub>	Pinch-off Voltage V <sub>ds</sub> =2V, I <sub>ds</sub> =1.0mA		-0.8	-2.5	V	
BV <sub>gd</sub>	Drain Breakdown Voltage I <sub>gd</sub> =10uA	-3	-6		V	
BV <sub>gs</sub>	Source Breakdown Voltage I <sub>gs</sub> =10uA	-3	-6		V	
R <sub>th</sub>	Thermal Resistance		480*		°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>
V <sub>ds</sub>	Drain-Source Voltage	5V	4V
V <sub>gs</sub>	Gate-Source Voltage	-3V	-2V
I <sub>ds</sub>	Drain Current	I <sub>dss</sub>	60mA
I <sub>gsf</sub>	Forward Gate Current	2mA	0.3mA
P <sub>in</sub>	Input Power	12dBm	@ 1dB Compression
T <sub>ch</sub>	Channel Temperature	175°C	150°C
T <sub>stg</sub>	Storage Temperature	-65/175°C	-65/150°C
P <sub>t</sub>	Total Power Dissipation	285mW	240mW

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.

# EPB018A5/A7/A9-70

## DATA SHEET Super Low Noise High Gain Heterojunction FET

EPB018A5-70 S-PARAMETERS 2V, 15mA									EPB018A7-70 S-PARAMETERS 2V, 15mA								
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	0.983	-18.6	6.245	162.2	0.019	78.9	0.530	-13.5	1.0	0.985	-18.9	5.754	162.0	0.021	77.1	0.677	-13.7
2.0	0.944	-37.5	5.964	144.3	0.036	65.2	0.507	-28.8	2.0	0.949	-38.2	5.495	143.9	0.040	63.1	0.650	-28.9
3.0	0.896	-55.5	5.582	127.7	0.050	53.6	0.485	-42.6	3.0	0.903	-56.2	5.137	127.2	0.055	50.5	0.622	-42.7
4.0	0.849	-72.6	5.327	112.4	0.063	43.6	0.464	-54.2	4.0	0.860	-73.6	4.914	111.8	0.067	39.1	0.595	-54.1
5.0	0.797	-89.2	5.111	97.6	0.074	33.1	0.421	-65.4	5.0	0.812	-90.4	4.726	96.9	0.079	28.5	0.549	-65.4
6.0	0.747	-103.7	4.799	83.4	0.081	23.4	0.370	-78.6	6.0	0.765	-104.9	4.461	82.4	0.086	17.8	0.495	-78.6
7.0	0.691	-118.6	4.503	69.9	0.085	13.9	0.344	-90.7	7.0	0.713	-119.9	4.189	68.6	0.092	7.3	0.464	-90.5
8.0	0.642	-132.8	4.277	57.0	0.088	4.7	0.303	-100.7	8.0	0.664	-134.3	3.982	55.4	0.093	-3.6	0.411	-100.6
9.0	0.600	-155.6	4.189	42.7	0.093	-5.1	0.271	-111.2	9.0	0.621	-157.1	3.908	40.9	0.096	-12.9	0.374	-108.6
10.0	0.567	-178.3	4.012	27.8	0.096	-16.3	0.228	-126.9	10.0	0.591	-179.4	3.759	25.7	0.098	-24.5	0.328	-121.7
11.0	0.534	170.3	3.846	15.5	0.094	-26.5	0.193	-145.5	11.0	0.564	169.0	3.644	12.8	0.099	-33.4	0.295	-140.0
12.0	0.515	155.6	3.758	2.9	0.093	-33.1	0.177	-161.2	12.0	0.541	153.2	3.551	-0.8	0.098	-43.3	0.266	-157.6
13.0	0.555	128.7	3.569	-12.5	0.091	-44.2	0.137	176.3	13.0	0.574	126.2	3.360	-16.6	0.096	-54.9	0.210	-174.2
14.0	0.596	106.0	3.317	-27.1	0.088	-55.6	0.114	151.4	14.0	0.609	103.6	3.093	-31.7	0.090	-66.7	0.173	167.6
15.0	0.592	91.3	3.214	-41.3	0.087	-66.9	0.141	123.9	15.0	0.598	88.8	2.985	-46.4	0.090	-78.4	0.187	139.8
16.0	0.597	74.3	3.086	-56.8	0.083	-81.1	0.158	94.5	16.0	0.597	71.4	2.857	-62.2	0.085	-92.9	0.194	109.8
17.0	0.619	59.2	2.756	-69.5	0.071	-90.3	0.134	68.1	17.0	0.612	55.7	2.548	-75.5	0.072	-102.8	0.155	89.8
18.0	0.670	49.9	2.668	-79.4	0.071	-97.3	0.136	64.0	18.0	0.661	46.6	2.472	-85.8	0.076	-105.2	0.183	89.7
19.0	0.668	33.0	2.623	-95.4	0.069	-115.9	0.169	51.0	19.0	0.657	29.0	2.381	-102.1	0.076	-126.2	0.221	68.8
20.0	0.708	17.3	2.551	-111.1	0.064	-131.4	0.172	37.8	20.0	0.697	13.2	2.286	-118.1	0.071	-141.6	0.240	56.1
21.0	0.757	8.2	2.447	-125.1	0.061	-144.1	0.159	18.7	21.0	0.740	4.4	2.173	-131.8	0.068	-155.3	0.221	40.9
22.0	0.743	-2.5	2.325	-139.4	0.063	-159.2	0.135	14.7	22.0	0.728	-5.8	2.067	-145.9	0.070	-167.9	0.210	36.8
23.0	0.726	-21.1	2.224	-158.5	0.065	179.4	0.115	-1.3	23.0	0.717	-24.4	1.958	-164.5	0.071	172.5	0.188	21.8
24.0	0.747	-39.6	2.063	-178.1	0.067	158.8	0.102	-39.6	24.0	0.743	-41.8	1.807	176.3	0.071	151.8	0.154	-5.5
25.0	0.709	-52.6	2.024	167.9	0.072	144.7	0.136	-56.6	25.0	0.710	-53.5	1.757	161.7	0.075	138.3	0.174	-28.1
26.0	0.683	-70.6	2.006	150.2	0.083	132.8	0.117	-71.3	26.0	0.689	-69.1	1.759	145.4	0.084	124.1	0.152	-47.5

EPB018A7-70 Noise Parameters Vds=2V, Ids=15mA				
Freq.	Gamma Opt		Nfmin	Rn/50
(GHz)	(MAG)	(ANG)	(dB)	
2	0.76	25	0.37	0.26
4	0.65	56	0.43	0.22
6	0.51	84	0.48	0.16
8	0.41	118	0.55	0.11
10	0.26	159	0.61	0.08
12	0.26	-144	0.68	0.08
14	0.32	-82	0.89	0.18
16	0.40	-46	1.10	0.29
18	0.40	-26	1.30	0.45
20	0.51	8	1.45	0.55
22	0.41	27	1.69	0.61
24	0.48	75	1.83	0.59
26	0.52	108	2.05	0.40