



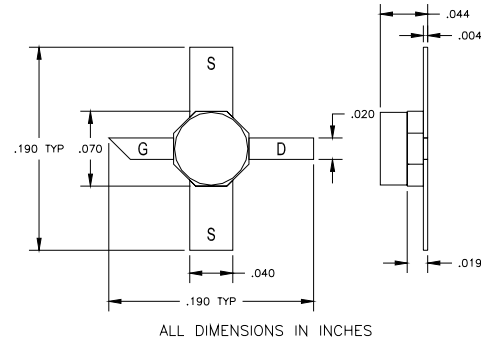
EPB018B5/B7/B9-70

ISSUED 11/01/2007

Super Low Noise High Gain Heterojunction FET

FEATURES

- 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
- Si₃N₄ PASSIVATION
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES SUPER LOW NOISE, HIGH GAIN AND HIGH RELIABILITY



Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNITS
NF	Noise Figure, f = 12GHz V _{DS} = 2 V, I _{DS} ≈ 15 mA	EPB018B5-70		0.50	0.60	dB
		EPB018B7-70		0.65	0.80	
		EPB018B9-70		0.95	1.20	
Ga	Associated Gain, f = 12GHz V _{DS} = 2 V, I _{DS} ≈ 15 mA	EPB018B5-70	11.5	13.0		dB
		EPB018B7-70	11.0	12.5		
		EPB018B9-70	10.5	11.5		
P _{1dB}	Output Power at 1dB Compression V _{DS} = 3 V, I _{DS} = 25 mA	f = 12GHz		15.0		dBm
		f = 18GHz		15.0		
G _{1dB}	Gain at 1dB Compression V _{DS} = 3 V, I _{DS} = 25 mA	f = 12GHz		14.0		dB
		f = 18GHz		11.5		
I _{DSS}	Saturated Drain Current	V _{DS} = 2 V, V _{GS} = 0 V	15	45	80	mA
G _M	Transconductance	V _{DS} = 2 V, V _{GS} = 0 V	50	90		mS
V _P	Pinch-off Voltage	V _{DS} = 2 V, I _{DS} = 1.0 mA		-0.8	-2.5	V
BV _{GD}	Drain Breakdown Voltage	I _{GD} = 10 uA	-3	-6		V
BV _{GS}	Source Breakdown Voltage	I _{GS} = 10 uA	-3	-6		V
R _{TH}	Thermal Resistance			480*		°C/W

Notes: * Overall R_{th} depends on case mounting.

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE ¹	CONTINUOUS ²
V _{ds}	Drain-Source Voltage	5V	4V
V _{gs}	Gate-Source Voltage	-3V	-2V
I _{ds}	Drain Current	I _{dss}	60mA
I _{gsf}	Forward Gate Current	2mA	0.3mA
P _{in}	Input Power	12dBm	@1dB Compression
T _{ch}	Channel Temperature	175°C	150°C
T _{stg}	Storage Temperature	-65/175°C	-65/150°C
P _t	Total Power Dissipation	285mW	240mW

Notes: 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.

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S-PARAMETERS VDS = 2 V, IDS = 15 mA

EPB018B5-70										EPB018B7-70									
FREQ (GHz)	-S11-		-S21-		-S12-		-S22-		FREQ (GHz)	-S11-		-S21-		-S12-		-S22-			
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		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		

NOISE-PARAMETERS EPB018B7-70 VDS = 2 V, IDS = 15 mA

FREQ (GHz)	Gamma Opt		Nfmin (dB)	Rn/50
	MAG	ANG		
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

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