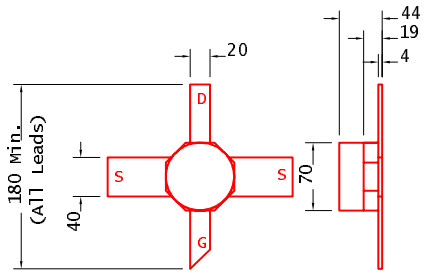
Excelics

EPA060B-70

DATA SHEET
High Efficiency Heterojunction Power FET

Features

- **NON-HERMETIC LOW COST CERAMIC 70mil PACKAGE**
- **+26dBm TYPICAL OUTPUT POWER**
- **9.0dB TYPICAL POWER GAIN AT 12 GHZ**
- **0.4 dB TYPICAL NOISE FIGURE AT 2GHz**
- **20 dB TYPICAL ASSOCIATED GAIN AT 2 GHz**
- **0.3 X 600 MICRON RECESSED "MUSHROOM" GATE**
- **Si_3N_4 PASSIVATION**
- **ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY, AND HIGH RELIABILITY**



All Dimensions In mils.

Applications

- **High Dynamic Range LNA**
- **DC to 18 GHz**

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS		MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Compression Vds=6V, Ids=50% Idss	f=2GHz f=12GHz	24.0	26.0 25.5		dBm
G_{1dB}	Gain at 1dB Compression Vds=6V, Ids=50% Idss	f=2GHz f=12GHz	17.0 7.0	19.0 9.0		dB
PAE	Power Added Efficiency at 1dB Compression Vds=6V, Ids=50% Idss	f=2GHz f=12GHz		55 45		%
IP3	+5dBm P_{OUT}/Tone (5V/50mA) (5V/90mA)	f=2GHz		28 31		dBm
NF	Noise Figure (5V/50mA) (5V/90mA)	f=2GHz		0.4 0.6		dB
G_A	Associated Gain (5V/50mA) (5V/90mA)	f=2GHz		20.0 20.0		dB
Idss	Saturated Drain Current Vds=3V, Vgs=0V		110	180	250	mA
Gm	Transconductance Vds=3V, Vgs=0V		120	190		mS
Vp	Pinch-off Voltage Vds=3V, Ids=2.0mA			-1.0	-2.5	V
BVgd	Drain Breakdown Voltage Igd=1.0mA		-10	-15		V
BVgs	Source Breakdown Voltage Igs=1.0mA		-6	-14		V
Rth	Thermal Resistance			175*		°C/W

*** Overall Rth depends on case mounting.**

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE[1]	CONTINUOUS[2]
Vds	Drain-Source Voltage	10V	6V
Vgs	Gate-Source Voltage	-6V	-3V
Ids	Drain Current	Idss	110mA
Igsf	Forward Gate Current	30mA	5mA
Pin	Input Power	23dBm	@ 3dB Compression
Tch	Channel Temperature	175°C	150 °C
Tstg	Storage Temperature	-65/175°C	-65/150 °C
Pt	Total Power Dissipation	780mW	650mW

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.

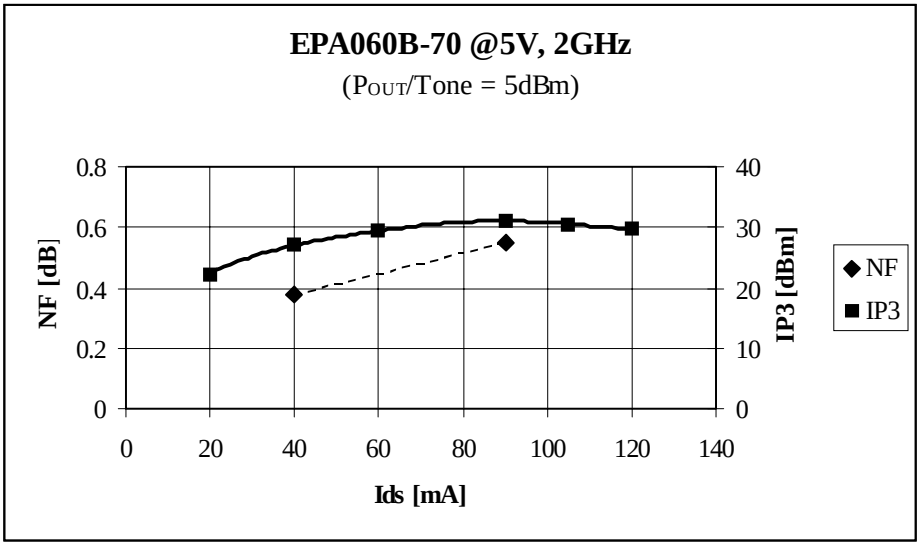
Excelics Semiconductor, Inc., 2908 Scott Blvd., Santa Clara, CA 95054
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Typical Performance

Noise Figure &IP3



S-PARAMETERS

6V, 1/2 Idss

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.863	-58.2	12.375	135.5	0.026	63.8	0.523	-24.4
2.0	0.696	-101.1	9.063	104.4	0.039	49.7	0.433	-41.0
3.0	0.604	-132.0	6.850	82.3	0.049	43.5	0.388	-51.9
4.0	0.555	-159.5	5.508	63.6	0.055	39.1	0.360	-60.8
5.0	0.538	177.3	4.614	47.0	0.065	35.5	0.322	-70.3
6.0	0.534	160.5	4.002	31.8	0.074	30.5	0.288	-84.5
7.0	0.533	141.8	3.532	16.7	0.083	25.3	0.281	-98.4
8.0	0.540	125.9	3.168	2.3	0.092	19.2	0.254	-111.5
9.0	0.582	105.0	2.817	-12.9	0.101	11.6	0.235	-125.6
10.0	0.622	88.1	2.532	-28.1	0.108	2.7	0.220	-148.1
11.0	0.642	74.5	2.370	-43.9	0.119	-8.1	0.225	-176.6
12.0	0.674	60.3	2.195	-60.1	0.129	-19.3	0.238	155.7
13.0	0.727	47.7	1.970	-74.8	0.132	-30.2	0.244	130.0
14.0	0.764	36.4	1.758	-88.3	0.133	-40.6	0.263	110.6
15.0	0.776	22.6	1.618	-104.8	0.137	-54.2	0.316	90.1
16.0	0.790	8.5	1.441	-122.5	0.134	-69.5	0.358	66.2
17.0	0.781	-1.1	1.285	-135.3	0.133	-78.3	0.363	51.0
18.0	0.792	-9.8	1.221	-147.7	0.144	-91.0	0.396	41.9
19.0	0.811	-22.2	1.106	-163.8	0.142	-106.2	0.418	23.9
20.0	0.836	-32.5	1.016	-179.0	0.144	-121.0	0.445	6.7
21.0	0.800	-41.8	0.975	166.9	0.157	-134.6	0.461	-8.4
22.0	0.761	-54.5	0.941	152.3	0.176	-148.9	0.426	-22.5
23.0	0.800	-68.3	0.861	134.7	0.190	-167.5	0.399	-50.3
24.0	0.799	-80.2	0.764	117.1	0.204	173.5	0.417	-78.5
25.0	0.719	-98.1	0.751	103.1	0.239	157.7	0.451	-87.9
26.0	0.718	-119.4	0.750	85.7	0.291	137.6	0.450	-110.4

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DATA SHEET
High Efficiency Heterojunction Power FET

S-PARAMETERS
5V,50ma

FREQ	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.948	-57.7	14.366	129.2	0.032	54.0	0.439	-48.4
2.0	0.739	-100.4	9.162	106.8	0.042	45.1	0.438	-44.9
3.0	0.656	-132.4	7.008	84.9	0.050	36.7	0.392	-56.7
4.0	0.619	-155.0	5.629	67.5	0.056	31.8	0.352	-64.7
5.0	0.597	-176.9	4.740	51.0	0.062	26.9	0.298	-74.4
6.0	0.577	162.1	4.086	35.5	0.069	22.1	0.284	-90.6
7.0	0.580	141.7	3.546	21.4	0.075	18.2	0.287	-96.4
8.0	0.616	122.1	3.145	6.6	0.081	11.3	0.264	-103.5
9.0	0.618	117.3	2.918	-7.4	0.088	4.0	0.148	-131.4
10.0	0.633	99.5	2.657	-22.4	0.097	-1.1	0.185	-169.4
11.0	0.673	76.6	2.345	-36.9	0.101	-10.0	0.208	-168.3
12.0	0.718	63.1	2.142	-50.5	0.108	-18.0	0.156	179.2
13.0	0.761	59.0	1.999	-65.3	0.117	-27.9	0.223	117.8
14.0	0.777	44.3	1.767	-81.5	0.118	-40.9	0.321	97.0
15.0	0.779	30.7	1.543	-91.8	0.115	-46.4	0.287	96.4
16.0	0.816	14.8	1.418	-107.4	0.117	-59.0	0.265	77.7
17.0	0.827	11.9	1.307	-123.3	0.121	-70.7	0.445	49.2
18.0	0.822	2.7	1.114	-132.8	0.114	-77.5	0.460	49.8
19.0	0.852	-9.8	1.090	-144.6	0.123	-87.1	0.424	38.2
20.0	0.868	-19.9	1.001	-158.4	0.122	-99.4	0.442	21.5
21.0	0.846	-31.4	0.911	-174.9	0.120	-114.7	0.576	9.4
22.0	0.838	-32.7	0.856	176.8	0.125	-121.6	0.515	9.9
23.0	0.860	-47.9	0.832	160.7	0.130	-137.4	0.446	-22.9
24.0	0.835	-66.2	0.763	141.8	0.128	-156.0	0.536	-40.8
25.0	0.819	-80.1	0.710	126.8	0.130	-170.6	0.536	-41.4
26.0	0.868	-78.4	0.699	111.8	0.145	174.2	0.383	-78.0

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Noise Parameters
Vds=5V, Ids=50mA

Freq.	Gamma Opt		Nfmin	Rn/50
(GHz)	(MAG)	(ANG)	(dB)	
2	0.46	44	0.45	0.11
4	0.35	96	0.55	0.08
6	0.23	165	0.75	0.06
8	0.27	-145	0.92	0.08
10	0.35	-85	1.37	0.23
12	0.46	-58	1.47	0.44
14	0.58	-33	1.92	0.89
16	0.68	-6	2.47	1.3
18	0.63	7	3.03	1.78
20	0.68	33	3.24	1.87
22	0.63	50	3.43	1.81
24	0.67	92	3.65	1.56
26	0.72	120	3.86	1.16