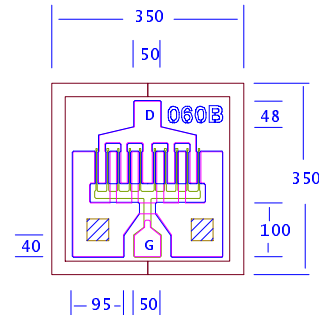


**DATA SHEET**
**High Efficiency Heterojunction Power FET**

- +26.5dBm TYPICAL OUTPUT POWER
- 10.0dB TYPICAL POWER GAIN FOR EPA060B AND 11.5dB FOR EPA060BV AT 18GHz
- 0.4dB TYPICAL NOISE FIGURE AT 2GHz
- 0.3 X 600 MICRON RECESSED “MUSHROOM” GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- EPA060BV WITH VIA HOLE SOURCE GROUNDING
- Idss SORTED IN 15mA PER BIN RANGE



Chip Thickness: 75 ± 20 microns  
All Dimensions In Microns

▣ : Via Hole

**No Via Hole For EPA060B**

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

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA060B			EPA060BV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression f=12GHz	25	26.5		25	26.5		dBm
	V <sub>ds</sub> =8V, I <sub>ds</sub> =50% Id <sub>ss</sub> f=18GHz		26.5			26.5		
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression f=12GHz	11	13		13	14.5		dB
	V <sub>ds</sub> =8V, I <sub>ds</sub> =50% Id <sub>ss</sub> f=18GHz		10			11.5		
<b>PAE</b>	Gain at 1dB Compression							%
	V <sub>ds</sub> =8V, I <sub>ds</sub> =50% Id <sub>ss</sub> f=12GHz		45			46		
<b>NF</b>	Noise Figure V <sub>ds</sub> =5V, I <sub>ds</sub> =50mA f=2GHz		0.4			0.4		dB
<b>GA</b>	Associated Gain V <sub>ds</sub> =5V, I <sub>ds</sub> =50mA f=2GHz		20			20		dB
<b>Id<sub>ss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	110	180	250	110	180	250	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	120	190		120	190		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =2.0mA		-1	-2.5		-1	-2.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =1.0mA	-11	-15		-11	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =1.0mA	-7	-14		-7	-14		V
<b>R<sub>th</sub></b>	Thermal Resistance (Au-Sn Eutectic Attach)		75			55		°C/W

**MAXIMUM RATINGS AT 25°C**

SYMBOLS	PARAMETERS	EPA060B		EPA060BV	
		ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
<b>V<sub>ds</sub></b>	Drain-Source Voltage	12V	8V	12V	8V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-8V	-3V	-8V	-3V
<b>I<sub>ds</sub></b>	Drain Current	I <sub>ds</sub>	190mA	I <sub>ds</sub>	I <sub>ds</sub>
<b>I<sub>gsf</sub></b>	Forward Gate Current	30mA	5mA	30mA	5mA
<b>P<sub>in</sub></b>	Input Power	24dBm	@ 3dB Compression	24dBm	@ 3dB Compression
<b>T<sub>ch</sub></b>	Channel Temperature	175°C	150°C	175°C	150°C
<b>T<sub>stg</sub></b>	Storage Temperature	-65/175°C	-65/150°C	-65/175°C	-65/150°C
<b>P<sub>t</sub></b>	Total Power Dissipation	1.8W	1.5W	2.5W	2.1W

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**

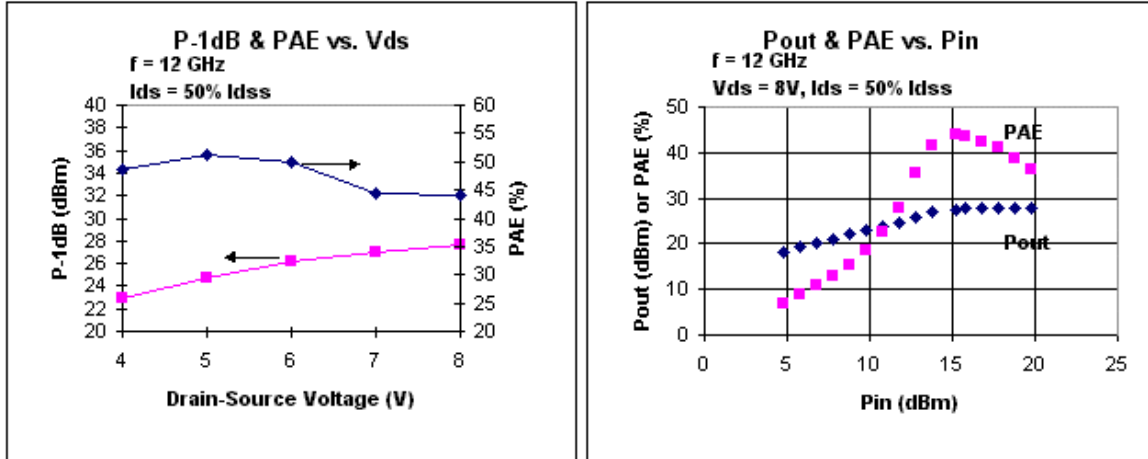
**Phone: (408) 970-8664 Fax: (408) 970-8998 Web Site: [www.excelics.com](http://www.excelics.com)**

# EPA060B/EPA060BV

## DATA SHEET

### High Efficiency Heterojunction Power FET

#### EPA060B



#### S-PARAMETERS

##### EPA060B 8V, 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	0.912	-55.0	13.184	146.1	0.025	58.3	0.496	-22.8	21.0	0.851	136.3	1.376	-26.4	0.062	-7.0	0.447	140.5
2.0	0.875	-91.9	10.384	124.2	0.038	43.8	0.408	-38.2	22.0	0.817	129.7	1.248	-34.0	0.063	-9.8	0.503	136.6
4.0	0.831	-134.1	6.817	94.7	0.047	24.8	0.291	-61.2	24.0	0.736	117.1	1.007	-47.5	0.064	-11.7	0.579	130.5
6.0	0.769	-161.8	4.779	73.1	0.047	15.2	0.247	-80.4	26.0	0.691	109.5	0.826	-56.5	0.065	-10.0	0.630	124.9
8.0	0.729	-179.0	3.510	57.1	0.045	10.0	0.238	-94.5	28.0	0.684	105.6	0.712	-62.8	0.070	-8.9	0.654	118.0
10.0	0.721	171.2	2.712	45.6	0.040	8.6	0.231	-104.0	30.0	0.711	105.9	0.662	-69.6	0.076	-11.0	0.676	106.7
12.0	0.747	165.5	2.232	35.7	0.040	10.8	0.227	-117.4	32.0	0.784	106.5	0.652	-79.4	0.077	-14.4	0.680	90.3
14.0	0.793	162.5	1.952	26.3	0.041	11.1	0.217	-136.4	34.0	0.881	105.0	0.631	-92.6	0.078	-26.4	0.733	69.7
16.0	0.842	158.5	1.790	14.4	0.046	9.0	0.234	-164.1	36.0	0.945	96.2	0.603	-110.7	0.079	-51.0	0.833	55.0
18.0	0.879	150.7	1.670	-0.5	0.053	3.2	0.291	171.1	38.0	0.867	79.5	0.513	-132.5	0.067	-92.7	0.940	42.8
20.0	0.871	138.7	1.509	-18.9	0.061	-4.6	0.375	149.3	40.0	0.723	63.1	0.398	-148.7	0.054	-132.5	0.965	38.8

#### S-PARAMETERS EPA060BV 8V, 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	0.940	-46.3	11.322	150.5	0.023	61.4	0.573	-19.4	21.0	0.917	129.3	1.213	-18.8	0.047	-38.3	0.501	-167.0
2.0	0.906	-82.2	9.363	129.0	0.037	45.1	0.505	-33.8	22.0	0.925	127.9	1.124	-24.5	0.045	-40.2	0.521	-174.2
4.0	0.874	-126.4	6.297	100.2	0.049	23.1	0.405	-50.3	24.0	0.932	125.0	0.980	-35.1	0.044	-41.5	0.578	174.4
6.0	0.874	-150.7	4.561	80.9	0.051	11.2	0.363	-62.0	26.0	0.925	121.9	0.871	-45.0	0.042	-41.4	0.627	166.0
8.0	0.872	-166.4	3.551	65.9	0.052	2.5	0.353	-73.2	28.0	0.921	117.0	0.791	-54.9	0.042	-41.1	0.670	158.7
10.0	0.871	-179.0	2.893	52.3	0.051	-5.8	0.357	-84.9	30.0	0.911	109.3	0.727	-65.9	0.042	-49.1	0.703	150.9
12.0	0.874	169.9	2.437	39.3	0.049	-11.2	0.365	-98.2	32.0	0.904	100.1	0.646	-78.1	0.039	-64.5	0.738	142.7
14.0	0.881	158.8	2.092	26.0	0.049	-18.8	0.375	-113.0	34.0	0.916	91.6	0.551	-89.8	0.038	-72.2	0.770	133.4
16.0	0.890	148.2	1.810	12.6	0.049	-24.5	0.395	-128.0	36.0	0.951	85.1	0.475	-100.8	0.041	-85.6	0.824	123.2
18.0	0.897	138.4	1.557	-1.0	0.050	-31.8	0.418	-144.2	38.0	0.994	80.6	0.410	-111.5	0.055	-104.3	0.870	112.4
20.0	0.907	129.8	1.350	-14.2	0.048	-37.9	0.450	-159.5	40.0	0.995	79.1	0.362	-122.6	0.069	-121.9	0.894	104.0

Note: The data included 0.7 mils diameter Au bonding wires; 1 gate wires, 15 mils each; 1 drain wires, 20 mils each; 4 source wires, 7 mils each; no source wires for EPA060BV.

# EPA060B/EPA060BV

## DATA SHEET

### High Efficiency Heterojunction Power FET

#### S-Parameters

EPA060B, 5V,50mA

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	0.953	-52.8	12.712	147.4	0.025	62.4	0.520	-23.3	21.0	0.860	128.5	1.258	-13.6	0.060	-2.4	0.393	-173.4
2.0	0.897	-92.2	9.967	124.4	0.039	44.7	0.427	-38.2	22.0	0.868	125.1	1.158	-19.1	0.059	-3.5	0.409	177.8
3.0	0.863	-118.3	7.789	108.0	0.046	32.5	0.347	-49.2	23.0	0.874	122.9	1.067	-24.1	0.061	-3.3	0.446	170.6
4.0	0.855	-136.6	6.274	95.7	0.049	24.9	0.301	-57.5	24.0	0.884	121.7	0.980	-28.3	0.060	-2.1	0.488	166.0
5.0	0.843	-149.0	5.236	86.4	0.051	20.4	0.290	-63.3	25.0	0.896	120.9	0.930	-32.0	0.062	0.1	0.509	163.3
6.0	0.831	-158.6	4.464	78.3	0.051	17.2	0.268	-69.4	26.0	0.880	121.3	0.849	-35.2	0.063	0.1	0.552	159.2
7.0	0.827	-167.1	3.891	70.5	0.051	15.5	0.261	-78.0	27.0	0.872	120.0	0.812	-37.7	0.065	1.9	0.574	160.4
8.0	0.832	-174.2	3.433	63.7	0.051	12.7	0.260	-84.5	28.0	0.856	117.8	0.789	-41.1	0.070	1.8	0.597	157.8
9.0	0.833	179.9	3.080	57.3	0.050	10.2	0.261	-90.1	29.0	0.860	113.9	0.771	-46.2	0.073	-0.1	0.607	154.4
10.0	0.832	174.3	2.781	51.1	0.050	8.5	0.255	-97.0	30.0	0.860	108.2	0.742	-51.5	0.075	-3.0	0.627	151.6
11.0	0.835	168.5	2.529	44.6	0.050	8.7	0.261	-105.6	31.0	0.848	101.5	0.725	-58.0	0.077	-6.4	0.622	147.5
12.0	0.845	164.3	2.291	38.9	0.050	7.4	0.265	-113.5	32.0	0.823	93.6	0.680	-65.2	0.075	-10.4	0.646	142.1
13.0	0.852	161.8	2.105	33.8	0.050	7.0	0.288	-121.4	33.0	0.841	85.8	0.638	-71.4	0.077	-14.7	0.654	136.6
14.0	0.849	158.9	1.968	28.8	0.050	7.1	0.311	-123.0	34.0	0.859	82.8	0.585	-76.1	0.074	-16.5	0.672	130.6
15.0	0.849	154.0	1.860	23.0	0.051	5.9	0.304	-125.2	35.0	0.900	81.7	0.554	-80.3	0.075	-22.0	0.703	124.3
16.0	0.851	147.2	1.743	15.8	0.052	3.5	0.297	-136.0	36.0	0.889	79.3	0.531	-85.4	0.075	-30.0	0.716	120.8
17.0	0.859	142.0	1.605	9.5	0.053	1.1	0.323	-145.6	37.0	0.888	74.3	0.510	-94.2	0.077	-41.9	0.717	105.9
18.0	0.863	138.8	1.491	4.4	0.053	0.8	0.340	-150.6	38.0	0.908	72.4	0.449	-101.4	0.071	-55.9	0.789	92.3
19.0	0.870	135.6	1.410	-1.7	0.056	0.4	0.350	-159.2	39.0	0.925	77.0	0.407	-101.4	0.064	-57.5	0.828	94.7
20.0	0.865	131.0	1.321	-8.2	0.058	-1.7	0.385	-167.2	40.0	0.939	83.8	0.396	-100.7	0.069	-61.8	0.789	100.3

EPA060B				
Noise Parameters				
Vds=5V, Ids=50mA				
Freq	Gamma Opt		Nfmin	Rn/50
(GHz)	(MAG)	(ANG)	(dB)	
2	0.4	44	0.45	0.09
4	0.46	89	0.55	0.07
6	0.52	108	0.75	0.06
8	0.52	137	0.92	0.05
10	0.53	162	1.37	0.04
12	0.54	174	1.47	0.04
14	0.58	-176	1.92	0.05
16	0.62	-162	2.47	0.06
18	0.68	-153	3.03	0.09
20	0.69	-147	3.24	0.14
22	0.7	-141	3.43	0.24
24	0.72	-132	3.65	0.38
26	0.74	-128	3.86	0.6