

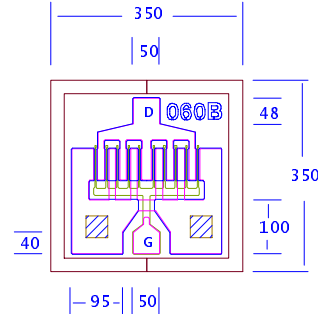


EPA060B/EPA060BV

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
- Si₃N₄ 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_a = 25 °C)

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

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	EPA060B		EPA060BV	
		ABSOLUTE ¹	CONTINUOUS ²	ABSOLUTE ¹	CONTINUOUS ²
V _{ds}	Drain-Source Voltage	12V	8V	12V	8V
V _{gs}	Gate-Source Voltage	-8V	-3V	-8V	-3V
I _{ds}	Drain Current	I _{dss}	190mA	I _{dss}	I _{dss}
I _{gsf}	Forward Gate Current	30mA	5mA	30mA	5mA
P _{in}	Input Power	24dBm	@ 3dB Compression	24dBm	@ 3dB Compression
T _{ch}	Channel Temperature	175°C	150°C	175°C	150°C
T _{stg}	Storage Temperature	-65/175°C	-65/150°C	-65/175°C	-65/150°C
P _t	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.

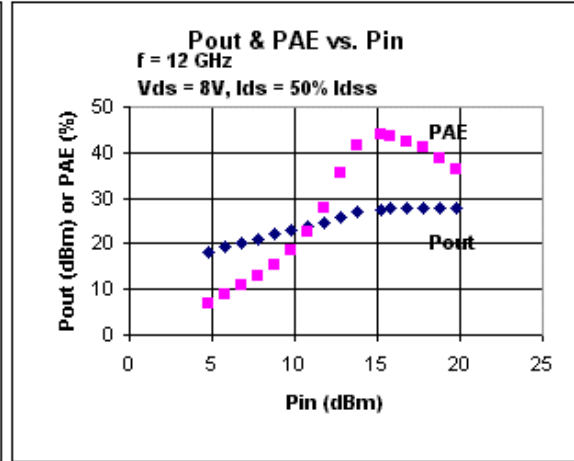
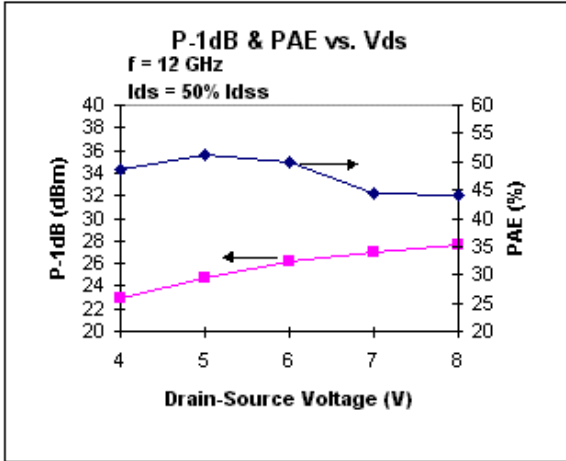
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EPA060B/EPA060BV

DATA SHEET

High Efficiency Heterojunction Power FET

EPA060B



S-PARAMETERS

EPA060B 8V, 1/2 Idss

FREQ (GHz)	S11		S21		S12		S22	
	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
2.0	0.875	-91.9	10.384	124.2	0.038	43.8	0.408	-38.2
4.0	0.831	-134.1	6.817	94.7	0.047	24.8	0.291	-61.2
6.0	0.769	-161.8	4.779	73.1	0.047	15.2	0.247	-80.4
8.0	0.729	-179.0	3.510	57.1	0.045	10.0	0.238	-94.5
10.0	0.721	171.2	2.712	45.6	0.040	8.6	0.231	-104.0
12.0	0.747	165.5	2.232	35.7	0.040	10.8	0.227	-117.4
14.0	0.793	162.5	1.952	26.3	0.041	11.1	0.217	-136.4
16.0	0.842	158.5	1.790	14.4	0.046	9.0	0.234	-164.1
18.0	0.879	150.7	1.670	-0.5	0.053	3.2	0.291	171.1
20.0	0.871	138.7	1.509	-18.9	0.061	-4.6	0.375	149.3
21.0	0.851	136.3	1.376	-26.4	0.062	-7.0	0.447	140.5
22.0	0.817	129.7	1.248	-34.0	0.063	-9.8	0.503	136.6
24.0	0.736	117.1	1.007	-47.5	0.064	-11.7	0.579	130.5
26.0	0.691	109.5	0.826	-56.5	0.065	-10.0	0.630	124.9
28.0	0.684	105.6	0.712	-62.8	0.070	-8.9	0.654	118.0
30.0	0.711	105.9	0.662	-69.6	0.076	-11.0	0.676	106.7
32.0	0.784	106.5	0.652	-79.4	0.077	-14.4	0.680	90.3
34.0	0.881	105.0	0.631	-92.6	0.078	-26.4	0.733	69.7
36.0	0.945	96.2	0.603	-110.7	0.079	-51.0	0.833	55.0
38.0	0.867	79.5	0.513	-132.5	0.067	-92.7	0.940	42.8
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 (GHz)	S11		S21		S12		S22	
	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
2.0	0.906	-82.2	9.363	129.0	0.037	45.1	0.505	-33.8
4.0	0.874	-126.4	6.297	100.2	0.049	23.1	0.405	-50.3
6.0	0.874	-150.7	4.561	80.9	0.051	11.2	0.363	-62.0
8.0	0.872	-166.4	3.551	65.9	0.052	2.5	0.353	-73.2
10.0	0.871	-179.0	2.893	52.3	0.051	-5.8	0.357	-84.9
12.0	0.874	169.9	2.437	39.3	0.049	-11.2	0.365	-98.2
14.0	0.881	158.8	2.092	26.0	0.049	-18.8	0.375	-113.0
16.0	0.890	148.2	1.810	12.6	0.049	-24.5	0.395	-128.0
18.0	0.897	138.4	1.557	-1.0	0.050	-31.8	0.418	-144.2
20.0	0.907	129.8	1.350	-14.2	0.048	-37.9	0.450	-159.5
21.0	0.917	129.3	1.213	-18.8	0.047	-38.3	0.501	-167.0
22.0	0.925	127.9	1.124	-24.5	0.045	-40.2	0.521	-174.2
24.0	0.932	125.0	0.980	-35.1	0.044	-41.5	0.578	174.4
26.0	0.925	121.9	0.871	-45.0	0.042	-41.4	0.627	166.0
28.0	0.921	117.0	0.791	-54.9	0.042	-41.1	0.670	158.7
30.0	0.911	109.3	0.727	-65.9	0.042	-49.1	0.703	150.9
32.0	0.904	100.1	0.646	-78.1	0.039	-64.5	0.738	142.7
34.0	0.916	91.6	0.551	-89.8	0.038	-72.2	0.770	133.4
36.0	0.951	85.1	0.475	-100.8	0.041	-85.6	0.824	123.2
38.0	0.994	80.6	0.410	-111.5	0.055	-104.3	0.870	112.4
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 (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	0.953	-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

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