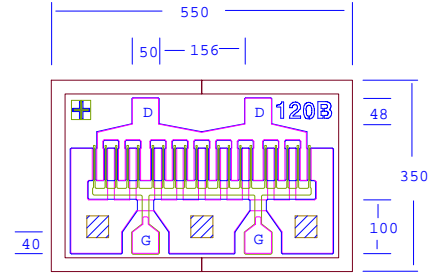


## DATA SHEET High Efficiency Heterojunction Power FET

- +29.5dBm TYPICAL OUTPUT POWER
- 9.0dB TYPICAL POWER GAIN FOR EPA120B AND 10.5dB FOR EPA120BV AT 18GHz
- 0.3 X 1200 MICRON RECESSED “MUSHROOM” GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY
- EPA120BV WITH VIA HOLE SOURCE GROUNDING
- Idss SORTED IN 30mA PER BIN RANGE



Chip Thickness: 75 ± 20 microns  
All Dimensions In Microns

☒ : Via Hole  
**No Via Hole For EPA120B**

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

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA120B			EPA120BV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub>	28.0	29.5		28.0	29.5		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub>	10.0	11.5		11.5	13.0		dB
<b>PAE</b>	Gain at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub>		45			46		%
<b>I<sub>dss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	220	360	500	220	360	500	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	240	380		240	380		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =3.0mA		-1.0	-2.5		-1.0	-2.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =1.2mA	-11	-15		-11	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =1.2mA	-7	-14		-7	-14		V
<b>R<sub>th</sub></b>	Thermal Resistance (Au-Sn Eutectic Attach)		40			30		°C/W

### MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	EPA120B		EPA120BV	
		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>dss</sub>	355mA	I <sub>dss</sub>	470mA
<b>I<sub>gsf</sub></b>	Forward Gate Current	60mA	10mA	60mA	10mA
<b>P<sub>in</sub></b>	Input Power	27dBm	@ 3dB Compression	27dBm	@ 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	3.4W	2.8W	4.5W	3.8W

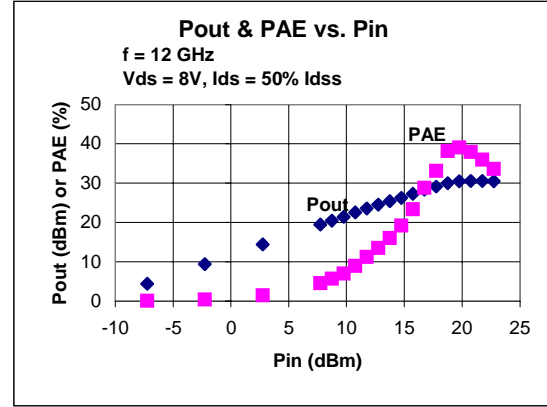
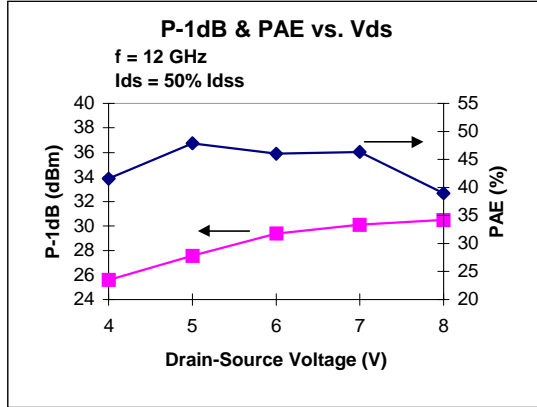
Note: 1. Exceeding any of the above ratings may result in permanent damage.

2. Exceeding any of the above ratings may reduce MTTF below design goals.

# EPA120B/EPA120BV

## DATA SHEET High Efficiency Heterojunction Power FET

### EPA120B



### S-PARAMETERS

EPA120B 8V, 1/2 Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.873	-97.8	14.614	124.8	0.030	40.1	0.245	-89.7
2.0	0.866	-133.3	8.974	103.2	0.035	27.0	0.239	-119.4
4.0	0.865	-159.6	4.841	81.9	0.038	19.8	0.258	-137.9
6.0	0.864	-170.9	3.287	67.7	0.037	21.8	0.296	-142.5
8.0	0.872	-177.9	2.476	55.8	0.037	23.5	0.344	-145.9
10.0	0.877	176.9	1.974	45.6	0.035	27.7	0.385	-149.2
12.0	0.890	171.7	1.633	35.0	0.036	30.8	0.429	-154.4
14.0	0.899	166.4	1.367	24.3	0.039	30.5	0.472	-161.9
16.0	0.901	161.5	1.148	13.5	0.041	29.9	0.519	-171.5
18.0	0.917	156.9	0.980	2.7	0.045	27.3	0.575	178.6
20.0	0.908	152.3	0.819	-7.9	0.051	26.1	0.635	169.2
22.0	0.896	149.4	0.698	-16.0	0.058	26.3	0.686	162.5
24.0	0.903	145.8	0.616	-23.4	0.069	26.7	0.734	157.7
26.0	0.886	143.8	0.552	-28.0	0.084	27.1	0.750	155.7

### S-PARAMETERS

EPA120BV 8V, 1/2 Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.887	-88.4	15.05	130.0	0.029	41.8	0.272	-73.8
2.0	0.879	-127.4	9.719	107.1	0.036	25.4	0.256	-107.7
4.0	0.887	-157.2	5.309	84.0	0.038	11.4	0.274	-129.7
6.0	0.899	-168.8	3.554	69.5	0.036	6.6	0.316	-137.2
8.0	0.905	-175.1	2.651	58.1	0.035	3.3	0.372	-140.3
10.0	0.909	-179.4	2.091	48.2	0.032	1.0	0.430	-143.1
12.0	0.913	176.6	1.726	38.2	0.030	-0.8	0.484	-147.7
14.0	0.916	171.5	1.462	27.9	0.030	-2.9	0.528	-154.0
16.0	0.925	165.2	1.263	16.8	0.030	-6.7	0.570	-162.0
18.0	0.930	157.9	1.088	4.6	0.030	-10.1	0.611	-171.8
20.0	0.939	151.1	0.936	-7.4	0.031	-14.1	0.654	178.3

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
21.0	0.946	149.8	0.824	-11.5	0.029	-15.2	0.700	174.9
22.0	0.956	148.9	0.752	-16.0	0.030	-13.2	0.720	170.6
24.0	0.967	148.0	0.636	-24.1	0.029	-11.8	0.769	164.6
26.0	0.967	148.0	0.554	-30.0	0.029	-4.9	0.799	162.4
28.0	0.956	148.0	0.503	-34.2	0.033	0.1	0.828	161.4
30.0	0.951	146.2	0.473	-39.5	0.034	-3.5	0.850	161.0
32.0	0.937	141.5	0.443	-47.2	0.033	-11.3	0.854	158.1
34.0	0.931	134.2	0.403	-57.4	0.029	-15.4	0.858	151.4
36.0	0.949	125.4	0.363	-69.3	0.029	-29.0	0.881	140.4
38.0	0.969	117.5	0.316	-81.0	0.038	-56.8	0.910	127.9
40.0	0.981	113.5	0.284	-92.8	0.050	-85.1	0.930	119.2

Note: The data included 0.7 mils diameter Au bonding wires; 2 gate wires, 15 mils each; 2 drain wires, 20 mils each; 6 source wires, 7 mils each; no source wires for EPA120BV.