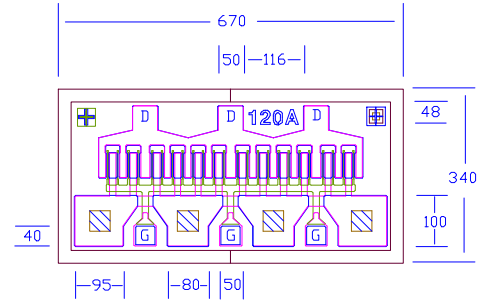


**DATA SHEET**
**High Efficiency Heterojunction Power FET**

- +29.5dBm TYPICAL OUTPUT POWER
- 9.5dB TYPICAL POWER GAIN FOR EPA120A AND 10.5dB FOR EPA120AV 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
- EPA120AV 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 EPA120A**

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

SYMBOLS	PARAMETERS/TEST CONDITIONS	EPA120A			EPA120AV			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
P <sub>1dB</sub>	Output Power at 1dB Compression f=12GHz	28.0	29.5		28.0	29.5		dBm
	V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz		29.5			29.5		
G <sub>1dB</sub>	Gain at 1dB Compression f=12GHz	10.0	12.0		10.5	12.5		dB
	V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=18GHz		9.5			10.5		
PAE	Gain at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =50% I <sub>dss</sub> f=12GHz		45			46		%
I <sub>dss</sub>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	220	360	500	220	360	500	mA
G <sub>m</sub>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	240	380		240	380		mS
V <sub>p</sub>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =3.5mA		-1.0	-2.5		-1.0	-2.5	V
BV <sub>gd</sub>	Drain Breakdown Voltage I <sub>gd</sub> =1.2mA	-11	-15		-11	-15		V
BV <sub>gs</sub>	Source Breakdown Voltage I <sub>gs</sub> =1.2mA	-7	-14		-7	-14		V
R <sub>th</sub>	Thermal Resistance (Au-Sn Eutectic Attach)		37			27		°C/W

**MAXIMUM RATINGS AT 25 °C**

SYMBOLS	PARAMETERS	EPA120A		EPA120AV	
		ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>ds</sub>	Drain-Source Voltage	12V	8V	12V	8V
V <sub>gs</sub>	Gate-Source Voltage	-8V	-3V	-8V	-3V
I <sub>ds</sub>	Drain Current	I <sub>dss</sub>	385mA	I <sub>dss</sub>	I <sub>dss</sub>
I <sub>gsf</sub>	Forward Gate Current	60mA	10mA	60mA	10mA
P <sub>in</sub>	Input Power	27dBm	@ 3dB Compression	27dBm	@ 3dB Compression
T <sub>ch</sub>	Channel Temperature	175°C	150°C	175°C	150°C
T <sub>stg</sub>	Storage Temperature	-65/175°C	-65/150°C	-65/175°C	-65/150°C
P <sub>t</sub>	Total Power Dissipation	3.7W	3.1W	5.0W	4.2W

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**

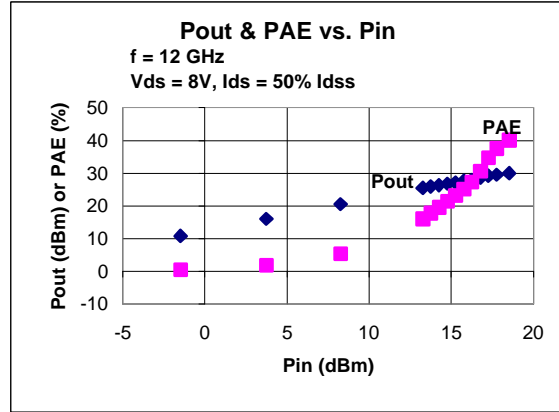
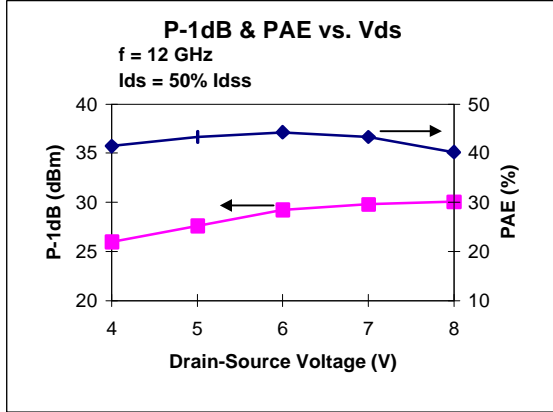
Phone: (408) 970-8664 Fax: (408) 970-8998 Web Site: [www.excelics.com](http://www.excelics.com)

# EPA120A/EPA120AV

## DATA SHEET

### High Efficiency Heterojunction Power FET

#### EPA120A



#### S-PARAMETERS

##### EPA120A 8V, 1/2 Idss

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	0.902	-95.7	15.160	125.3	0.030	41.8	0.305	-68.3	21.0	0.898	157.5	0.776	-8.5	0.041	21.0	0.674	-170.7
2.0	0.891	-131.8	9.261	103.2	0.036	25.7	0.252	-96.8	22.0	0.899	157.6	0.727	-12.2	0.042	22.3	0.691	-174.7
4.0	0.879	-157.0	4.926	81.5	0.038	14.7	0.254	-116.2	24.0	0.897	151.5	0.634	-20.6	0.045	23.3	0.721	-179.0
6.0	0.882	-166.8	3.290	67.5	0.037	11.8	0.290	-126.9	26.0	0.909	148.8	0.557	-29.2	0.051	24.6	0.741	172.1
8.0	0.882	-176.2	2.498	54.3	0.036	12.3	0.351	-132.3	28.0	0.918	151.8	0.484	-36.6	0.056	23.4	0.756	158.7
10.0	0.883	175.0	1.984	42.0	0.035	12.1	0.424	-138.9	30.0	0.915	148.1	0.424	-44.0	0.059	21.5	0.787	152.2
12.0	0.892	171.6	1.603	31.3	0.034	13.6	0.479	-147.5	32.0	0.913	143.6	0.365	-51.2	0.060	17.6	0.807	148.1
14.0	0.900	168.9	1.302	21.7	0.033	16.2	0.534	-154.8	34.0	0.911	140.5	0.318	-56.9	0.058	18.3	0.822	146.3
16.0	0.906	166.1	1.075	12.8	0.033	18.1	0.590	-159.7	36.0	0.918	136.7	0.287	-60.3	0.063	18.2	0.841	145.6
18.0	0.907	161.8	0.903	4.7	0.034	20.3	0.629	-161.4	38.0	0.929	135.7	0.270	-64.3	0.069	9.9	0.842	142.7
20.0	0.900	159.5	0.806	-4.3	0.038	20.1	0.668	-168.0	40.0	0.899	134.0	0.254	-70.4	0.070	-1.9	0.843	138.4

##### EPA120AV 8V, 1/2 Idss

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	0.921	-97.5	14.598	125.1	0.028	40.3	0.279	-75.6	21.0	0.947	155.6	0.730	-11.5	0.030	2.4	0.716	-174.0
2.0	0.905	-134.6	8.894	102.7	0.035	23.0	0.263	-104.4	22.0	0.945	154.3	0.675	-15.4	0.030	1.1	0.738	-176.1
4.0	0.901	-160.6	4.739	81.1	0.035	10.5	0.284	-120.1	24.0	0.942	149.6	0.576	-23.2	0.030	4.1	0.785	-179.7
6.0	0.906	-175.2	3.186	66.3	0.035	6.3	0.334	-124.0	26.0	0.939	147.1	0.492	-31.5	0.030	7.2	0.817	172.9
8.0	0.912	-179.0	2.421	54.2	0.033	4.2	0.364	-133.1	28.0	0.916	139.4	0.425	-40.2	0.032	6.7	0.858	169.6
10.0	0.915	178.0	1.919	42.5	0.031	0.3	0.413	-144.1	30.0	0.905	131.1	0.370	-49.5	0.033	3.2	0.878	166.2
12.0	0.925	169.8	1.536	30.3	0.029	0.1	0.484	-149.4	32.0	0.871	128.7	0.325	-58.7	0.031	-5.4	0.924	157.1
14.0	0.933	165.1	1.244	19.7	0.027	-2.0	0.553	-156.5	34.0	0.928	128.0	0.284	-66.9	0.027	-7.7	0.878	149.3
16.0	0.943	160.9	1.019	9.9	0.026	2.3	0.618	-161.3	36.0	0.976	129.5	0.263	-72.8	0.028	-5.3	0.898	142.6
18.0	0.946	161.7	0.862	1.8	0.027	1.0	0.666	-169.4	38.0	1.002	131.8	0.252	-77.5	0.038	-24.8	0.937	136.5
20.0	0.947	158.2	0.749	-6.3	0.027	0.5	0.712	-172.2	40.0	1.001	131.2	0.240	-83.0	0.047	-52.6	0.944	135.4

Note: The data included 0.7 mils diameter Au bonding wires; 3 gate wires, 15 mils each; 3 drain wires, 20 mils each; 8 source wires, 7 mils each; no source wires for EPA120AV.