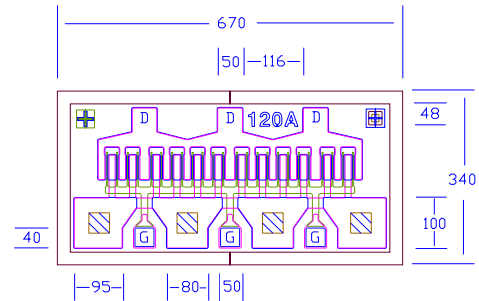




# EPA120A/EPA120AV

## 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



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 Pwr @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		360	500		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 ABSOLUTE <sup>1</sup>	EPA120AV ABSOLUTE <sup>1</sup>
V <sub>ds</sub>	Drain-Source Voltage	12V	12V
V <sub>gs</sub>	Gate-Source Voltage	-8V	-8V
I <sub>ds</sub>	Drain Current	I <sub>dss</sub>	I <sub>dss</sub>
I <sub>gsf</sub>	Forward Gate Current	60mA	60mA
P <sub>in</sub>	Input Power	27dBm	27dBm
T <sub>ch</sub>	Channel Temperature	175°C	175°C
T <sub>stg</sub>	Storage Temperature	-65/175°C	-65/175°C
P <sub>t</sub>	Total Power Dissipation	3.7W	5.0W

Note: 1. Exceeding any of the above ratings may result in permanent damage.  
 Recommended conditions for reliable operation are V<sub>ds</sub> of 8V maximum, channel temperature below 150 °C, and input power lower than 3dB gain compression point.

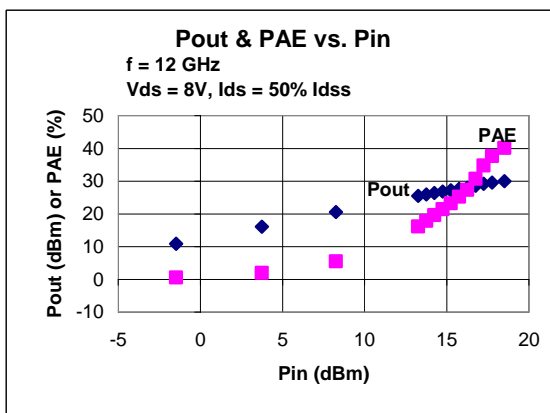
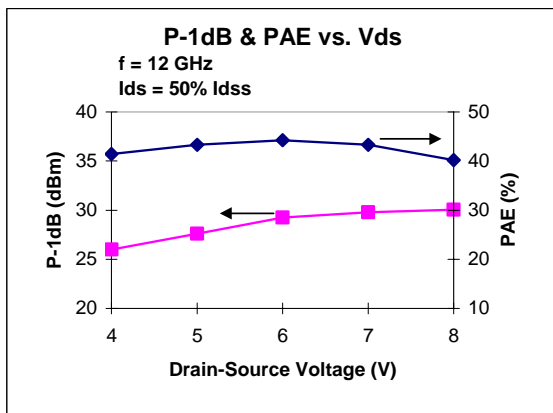
Specifications are subject to change without notice.



# EPA120A/EPA120AV

## High Efficiency Heterojunction Power FET

### EPA120A



### S-PARAMETERS

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

FREQ (GHz)	S11 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
1.0	0.902	-95.7	15.160	125.3	0.030	41.8	0.305	-68.3
2.0	0.891	-131.8	9.261	103.2	0.036	25.7	0.252	-96.8
4.0	0.879	-157.0	4.926	81.5	0.038	14.7	0.254	-116.2
6.0	0.882	-166.8	3.290	67.5	0.037	11.8	0.290	-126.9
8.0	0.882	-176.2	2.498	54.3	0.036	12.3	0.351	-132.3
10.0	0.883	175.0	1.984	42.0	0.035	12.1	0.424	-138.9
12.0	0.892	171.6	1.603	31.3	0.034	13.6	0.479	-147.5
14.0	0.900	168.9	1.302	21.7	0.033	16.2	0.534	-154.8
16.0	0.906	166.1	1.075	12.8	0.033	18.1	0.590	-159.7
18.0	0.907	161.8	0.903	4.7	0.034	20.3	0.629	-161.4
20.0	0.900	159.5	0.806	-4.3	0.038	20.1	0.668	-168.0
21.0	0.898	157.5	0.776	-8.5	0.041	21.0	0.674	-170.7
22.0	0.899	157.6	0.727	-12.2	0.042	22.3	0.691	-174.7
24.0	0.897	151.5	0.634	-20.6	0.045	23.3	0.721	-179.0
26.0	0.909	148.8	0.557	-29.2	0.051	24.6	0.741	172.1
28.0	0.918	151.8	0.484	-36.6	0.056	23.4	0.756	158.7
30.0	0.915	148.1	0.424	-44.0	0.059	21.5	0.787	152.2
32.0	0.913	143.6	0.365	-51.2	0.060	17.6	0.807	148.1
34.0	0.911	140.5	0.318	-56.9	0.058	18.3	0.822	146.3
36.0	0.918	136.7	0.287	-60.3	0.063	18.2	0.841	145.6
38.0	0.929	135.7	0.270	-64.3	0.069	9.9	0.842	142.7
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 MAG	S11 ANG	S21 MAG	S21 ANG	S12 MAG	S12 ANG	S22 MAG	S22 ANG
1.0	0.921	-97.5	14.598	125.1	0.028	40.3	0.279	-75.6
2.0	0.905	-134.6	8.894	102.7	0.035	23.0	0.263	-104.4
4.0	0.901	-160.6	4.739	81.1	0.035	10.5	0.284	-120.1
6.0	0.906	-175.2	3.186	66.3	0.035	6.3	0.334	-124.0
8.0	0.912	-179.0	2.421	54.2	0.033	4.2	0.364	-133.1
10.0	0.915	178.0	1.919	42.5	0.031	0.3	0.413	-144.1
12.0	0.925	169.8	1.536	30.3	0.029	0.1	0.484	-149.4
14.0	0.933	165.1	1.244	19.7	0.027	-2.0	0.553	-156.5
16.0	0.943	160.9	1.019	9.9	0.026	2.3	0.618	-161.3
18.0	0.946	161.7	0.862	1.8	0.027	1.0	0.666	-169.4
20.0	0.947	158.2	0.749	-6.3	0.027	0.5	0.712	-172.2
21.0	0.947	155.6	0.730	-11.5	0.030	2.4	0.716	-174.0
22.0	0.945	154.3	0.675	-15.4	0.030	1.1	0.738	-176.1
24.0	0.942	149.6	0.576	-23.2	0.030	4.1	0.785	-179.7
26.0	0.939	147.1	0.492	-31.5	0.030	7.2	0.817	172.9
28.0	0.916	139.4	0.425	-40.2	0.032	6.7	0.858	169.6
30.0	0.905	131.1	0.370	-49.5	0.033	3.2	0.878	166.2
32.0	0.871	128.7	0.325	-58.7	0.031	-5.4	0.924	157.1
34.0	0.928	128.0	0.284	-66.9	0.027	-7.7	0.878	149.3
36.0	0.976	129.5	0.263	-72.8	0.028	-5.3	0.898	142.6
38.0	1.002	131.8	0.252	-77.5	0.038	-24.8	0.937	136.5
40.0	1.001	131.2	0.240	-83.0	0.047	-52.6	0.944	135.4

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# EPA120A/EPA120AV

## High Efficiency Heterojunction Power FET

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