



# EPA480C-SOT89

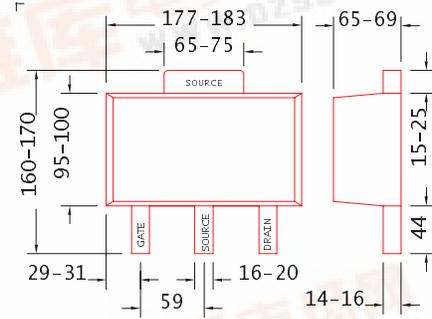
## DATA SHEET DC-6GHz High Efficiency Heterojunction Power FET

### Features

- LOW COST SURFACE-MOUNT PLASTIC PACKAGE
- +36dBm TYPICAL OUTPUT POWER
- 13.0dB TYPICAL POWER GAIN AT 2GHz
- 0.5dB TYPICAL NOISE FIGURE AT 2GHz
- +43dBm TYPICAL OUTPUT 3rd ORDER INTERCEPT POINT AT 2GHz
- 0.4 X 4800 MICRON RECESSED “MUSHROOM” GATE
- Si<sub>3</sub>N<sub>4</sub> PASSIVATION
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY AND HIGH RELIABILITY

### Applications

- Analog and Digital Wireless System
- High Dynamic Range LNA
- HPA



(Top View)  
All Dimensions In Mils

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

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
P <sub>1dB</sub>	Output Power at 1dB Compression f = 2GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA	34.5	36.0		dBm
G <sub>1dB</sub>	Gain at 1dB Compression f = 2GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA	11.0	13.0		dB
PAE	Power Added Efficiency at 1dB Compression f = 2GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA		50		%
NF	Noise Figure f = 2GHz V <sub>ds</sub> =5V, I <sub>ds</sub> =300mA V <sub>ds</sub> =5-8V, I <sub>ds</sub> =750mA		0.5 1.2		dB
IP3	Output 3rd Order Intercept Point f = 2GHz V <sub>ds</sub> =5-8V, I <sub>ds</sub> =750mA V <sub>ds</sub> =5V, I <sub>ds</sub> =300mA		43 41		dBm
I <sub>dss</sub>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	880	1440	1880	mA
G <sub>m</sub>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	960	1560		mS
V <sub>p</sub>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =14mA		-1.0	-2.5	V
BV <sub>gd</sub>	Drain Breakdown Voltage I <sub>gd</sub> =4.8mA	-11	-15		V
BV <sub>gs</sub>	Source Breakdown Voltage I <sub>gs</sub> =4.8mA	-7	-14		V
R <sub>th</sub>	Thermal Resistance		14*		°C/W

\* Overall R<sub>th</sub> depends on case mounting.

### MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>ds</sub>	Drain-Source Voltage	12V	8V
V <sub>gs</sub>	Gate-Source Voltage	-8V	-3V
I <sub>ds</sub>	Drain Current	I <sub>dss</sub>	1.05A
I <sub>gsf</sub>	Forward Gate Current	240mA	40mA
P <sub>in</sub>	Input Power	33dBm	@ 3dB Compression
T <sub>ch</sub>	Channel Temperature	175°C	150°C
T <sub>stg</sub>	Storage Temperature	-65/175°C	-65/150°C
P <sub>t</sub>	Total Power Dissipation	10 W	8.4 W

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.

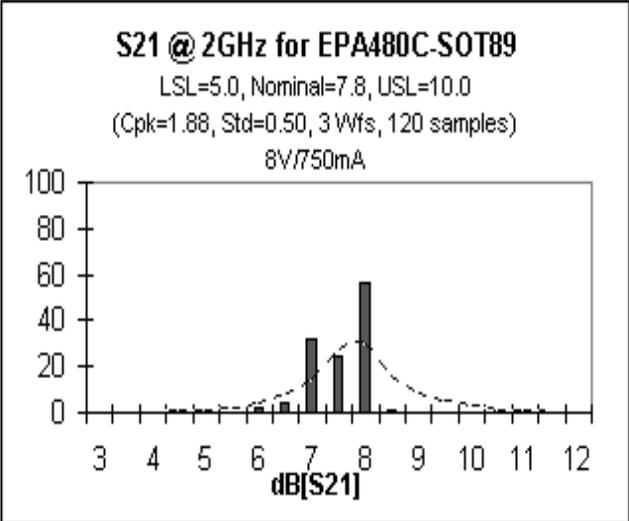


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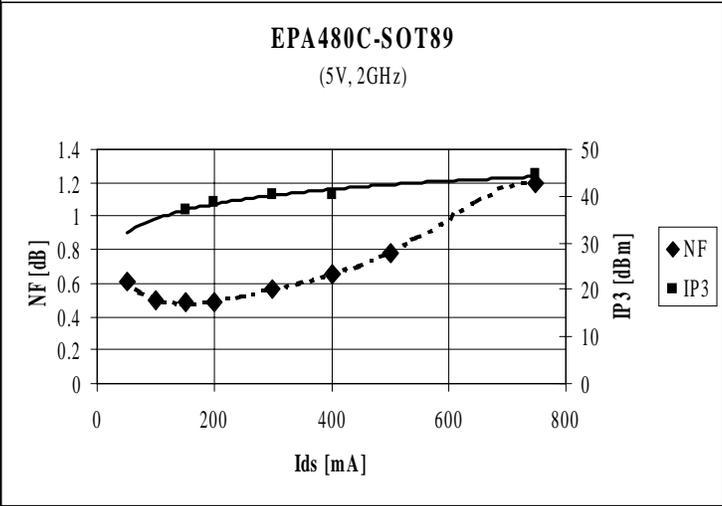
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### Typical Performance

**S21 Distribution**



**Noise Figure & IP3**



### S-PARAMETERS

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8V, 750mA								
FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.917	-118.9	31.148	119.1	0.017	41.6	0.696	-165.9
0.2	0.918	-146.6	17.708	102.7	0.015	28.6	0.720	-172.5
0.3	0.935	-159.4	12.132	94.9	0.017	30.6	0.722	-176.2
0.4	0.935	-166.5	9.200	89.6	0.017	33.5	0.725	-178.9
0.5	0.931	-172.0	7.382	85.7	0.018	33.9	0.724	-179.3
1.0	0.921	-174.2	3.742	71.2	0.027	42.4	0.711	-171.5
1.5	0.876	-161.6	3.201	60.2	0.047	43.1	0.629	-158.9
2.0	0.866	-152.3	2.452	49.3	0.061	40.0	0.622	-151.8
2.5	0.850	-144.2	2.053	38.7	0.076	35.2	0.607	-145.2
3.0	0.843	-135.1	1.821	27.3	0.093	28.8	0.578	-137.7
3.5	0.829	-123.0	1.654	14.5	0.112	20.0	0.548	-129.0
4.0	0.814	-108.9	1.524	0.4	0.132	9.3	0.545	-117.8
4.5	0.820	-94.0	1.364	-14.5	0.146	-2.5	0.552	-104.8
5.0	0.834	-80.8	1.206	-28.1	0.156	-13.9	0.575	-91.8
5.5	0.850	-70.4	1.070	-40.1	0.163	-23.9	0.594	-79.5
6.0	0.857	-62.6	0.969	-51.4	0.170	-34.4	0.615	-68.0
6.5	0.868	-54.4	0.892	-61.9	0.174	-42.0	0.642	-57.3
7.0	0.869	-43.7	0.845	-73.0	0.185	-50.8	0.653	-48.8
7.5	0.873	-30.2	0.791	-85.9	0.192	-60.6	0.660	-39.0
8.0	0.863	-16.3	0.705	-98.8	0.201	-70.6	0.657	-26.9
8.5	0.863	-5.8	0.621	-109.3	0.199	-84.0	0.676	-15.0
9.0	0.872	-1.7	0.547	-118.7	0.183	-94.7	0.696	-5.3
9.5	0.869	-6.7	0.484	-126.2	0.179	-102.3	0.696	-2.9
10.0	0.860	-9.5	0.439	-134.2	0.163	-115.2	0.700	-7.4

5V, 150mA								
FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.928	-112.1	28.454	121.6	0.018	41.0	0.675	-161.0
0.2	0.931	-143.9	16.571	104.7	0.020	33.2	0.744	-169.5
0.3	0.938	-157.7	11.424	96.5	0.020	26.5	0.747	-174.5
0.4	0.937	-165.4	8.690	91.0	0.023	26.6	0.754	-178.0
0.5	0.932	-171.2	6.989	87.0	0.024	27.2	0.756	-180.0
1.0	0.918	-174.6	3.558	72.4	0.032	33.9	0.747	-171.4
1.5	0.872	-162.1	3.066	61.6	0.051	35.7	0.674	-158.7
2.0	0.862	-152.7	2.349	50.9	0.065	33.2	0.666	-151.2
2.5	0.845	-144.5	1.971	40.4	0.080	30.0	0.653	-144.1
3.0	0.837	-135.4	1.756	29.0	0.097	23.3	0.625	-136.1
3.5	0.823	-123.2	1.597	16.5	0.116	15.0	0.593	-126.9
4.0	0.807	-109.1	1.475	2.5	0.135	5.1	0.589	-115.5
4.5	0.814	-94.2	1.325	-12.2	0.148	-6.4	0.596	-102.2
5.0	0.828	-80.9	1.172	-25.6	0.157	-17.9	0.616	-89.5
5.5	0.843	-70.6	1.042	-37.6	0.164	-27.6	0.633	-77.1
6.0	0.850	-62.8	0.943	-48.5	0.171	-37.7	0.650	-65.6
6.5	0.861	-54.6	0.871	-58.9	0.174	-45.5	0.674	-55.0
7.0	0.861	-43.9	0.827	-69.7	0.185	-54.0	0.684	-46.7
7.5	0.864	-30.5	0.778	-82.4	0.192	-63.4	0.687	-36.6
8.0	0.857	-16.7	0.697	-95.2	0.199	-73.1	0.684	-24.5
8.5	0.857	-6.1	0.618	-105.6	0.197	-86.1	0.699	-13.3
9.0	0.869	-1.4	0.545	-115.0	0.183	-96.5	0.718	-3.4
9.5	0.864	-6.5	0.487	-122.7	0.178	-104.6	0.720	-4.4
10.0	0.856	-9.2	0.439	-130.6	0.163	-117.5	0.715	-9.0