

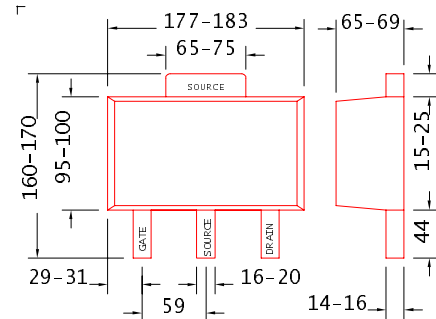
**DATA SHEET**  
**DC-6GHz High Efficiency Heterojunction Power FET**

**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
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression f = 2GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA	34.5	36.0		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression f = 2GHz V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA	11.0	13.0		dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>ds</sub> =8V, I <sub>ds</sub> =750mA f = 2GHz		50		%
<b>NF</b>	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
<b>IP3</b>	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
<b>I<sub>dss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	880	1440	1880	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	960	1560		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =14mA		-1.0	-2.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =4.8mA	-11	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =4.8mA	-7	-14		V
<b>R<sub>th</sub></b>	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>
<b>V<sub>ds</sub></b>	Drain-Source Voltage	12V	8V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-8V	-3V
<b>I<sub>ds</sub></b>	Drain Current	I <sub>dss</sub>	1.05A
<b>I<sub>gsf</sub></b>	Forward Gate Current	240mA	40mA
<b>P<sub>in</sub></b>	Input Power	33dBm	@ 3dB Compression
<b>T<sub>ch</sub></b>	Channel Temperature	175°C	150°C
<b>T<sub>stg</sub></b>	Storage Temperature	-65/175°C	-65/150°C
<b>P<sub>t</sub></b>	Total Power Dissipation	10 W	8.4 W

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

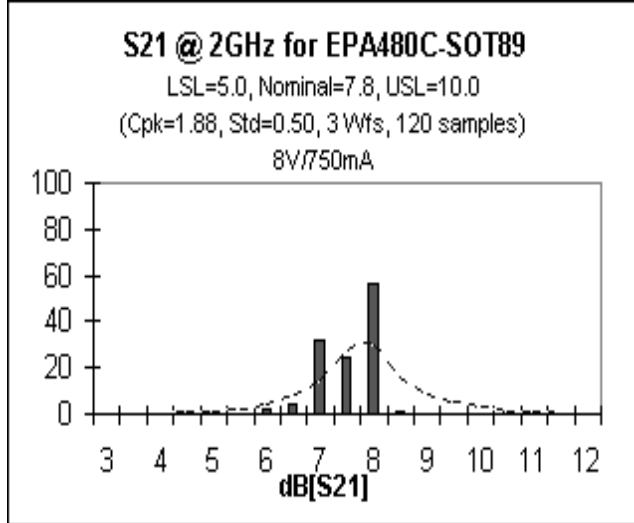
2. Exceeding any of the above ratings may reduce MTTF below design goals.

# EPA480C-SOT89

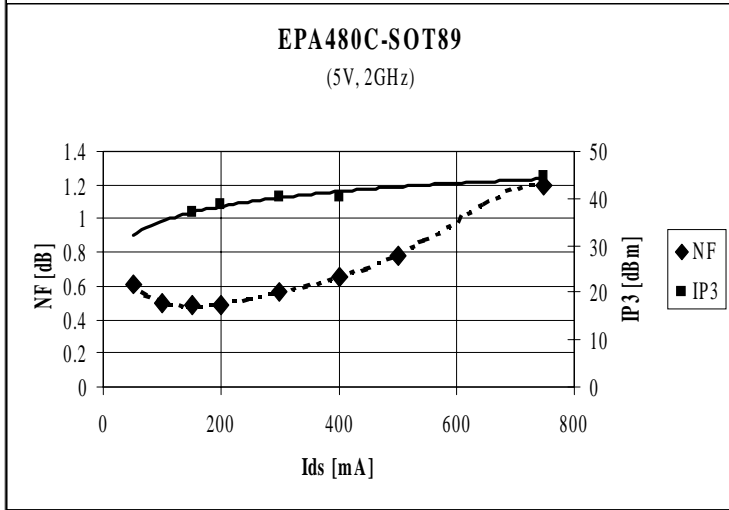
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### Typical Performance

#### S21 Distribution



#### Noise Figure & IP3



### S-PARAMETERS

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
8V, 750mA								
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

### S-PARAMETERS

FREQ (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5V, 150mA								
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