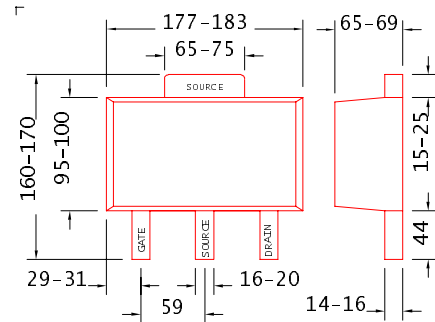


**DATA SHEET**  
**DC-4GHz Low Distortion GaAs Power FET**
**Features**

- **LOW COST SURFACE-MOUNT PLASTIC PACKAGE**
- **+31.0dBm TYPICAL OUTPUT POWER**
- **13.0dB TYPICAL POWER GAIN AT 2GHz**
- **0.7dB TYPICAL NOISE FIGURE AT 2GHz**
- **+48dBm TYPICAL OUTPUT 3rd ORDER INTERCEPT POINT AT 2GHz**
- **0.5 X 2400 MICRON RECESSED “MUSHROOM” GATE**
- **Si<sub>3</sub>N<sub>4</sub> PASSIVATION**
- **ADVANCED EPITAXIAL DOPING PROFILE PROVIDES HIGH POWER EFFICIENCY, LINEARITY AND RELIABILITY**



(Top View)  
All Dimensions In Mils

**Applications**

- **Analog and Digital Wireless System**
- **HPA**

**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> =7V, I <sub>ds</sub> =350mA	29.5	31.0		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression f = 2GHz V <sub>ds</sub> =7V, I <sub>ds</sub> =350mA	11.0	13.0		dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>ds</sub> =7V, I <sub>ds</sub> =350mA f = 2GHz		45		%
<b>NF</b>	Noise Figure f = 2GHz V <sub>ds</sub> =5V, I <sub>ds</sub> =150mA V <sub>ds</sub> =5-7V, I <sub>ds</sub> =350mA		0.7 1.2		dB
<b>IP3</b>	Output 3rd Order Intercept Point f = 2GHz V <sub>ds</sub> =5-7V, I <sub>ds</sub> =350mA V <sub>ds</sub> =5V, I <sub>ds</sub> =150mA		48 36		dBm
<b>I<sub>dss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	440	680	880	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	280	360		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =6mA		-2.0	-3.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =2.4mA	-11	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =2.4mA	-7	-14		V
<b>R<sub>th</sub></b>	Thermal Resistance		25*		°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	7V
<b>V<sub>gs</sub></b>	Gate-Source Voltage	-8V	-4V
<b>I<sub>ds</sub></b>	Drain Current	I <sub>dss</sub>	660mA
<b>I<sub>gsf</sub></b>	Forward Gate Current	60mA	10mA
<b>P<sub>in</sub></b>	Input Power	29dBm	@ 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	5.5 W	4.6 W

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

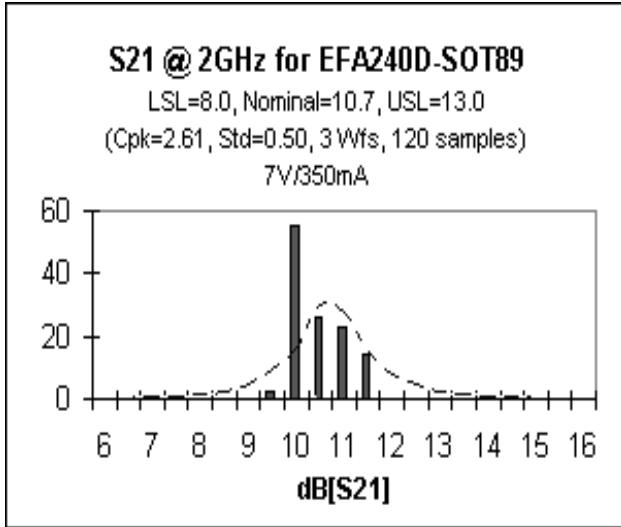
2. Exceeding any of the above ratings may reduce MTTF below design goals.

# EFA240D-SOT89

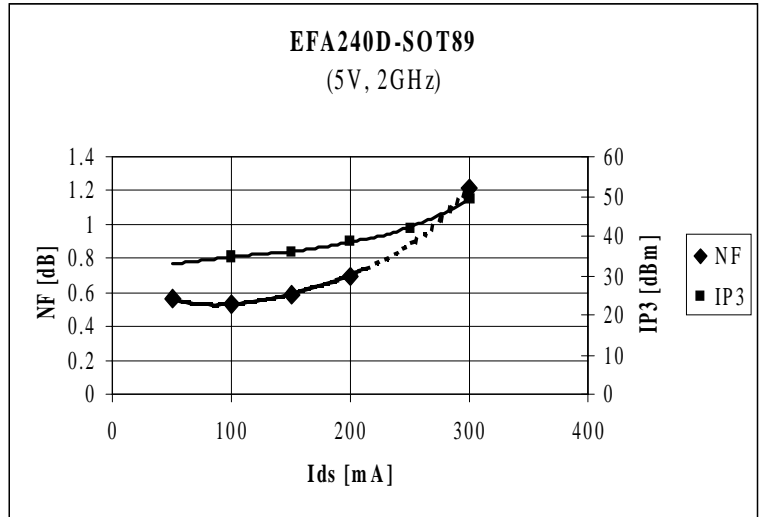
## DATA SHEET DC-4GHz Low Distortion GaAs Power FET

### Typical Performance

S21 Distribution



Noise Figure & IP3



### S-PARAMETERS

5V, 150mA										7V, 350mA									
FREQ	S11		S21		S12		S22			FREQ	S11		S21		S12		S22		
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
0.1	0.980	-29.5	15.580	162.1	0.009	50.3	0.273	-165.8		0.1	0.970	-32.8	17.023	161.5	0.019	75.7	0.148	-137.8	
0.2	0.964	-56.5	14.250	147.1	0.024	61.6	0.348	-155.7		0.2	0.952	-58.4	15.321	145.4	0.023	58.2	0.241	-133.9	
0.3	0.942	-78.3	12.624	134.2	0.029	51.8	0.407	-157.6		0.3	0.927	-80.6	13.396	132.4	0.030	49.9	0.312	-140.8	
0.4	0.923	-96.1	11.069	123.8	0.035	43.6	0.459	-161.2		0.4	0.911	-98.4	11.673	121.9	0.034	41.9	0.362	-147.9	
0.5	0.907	-110.1	9.717	115.0	0.039	38.2	0.494	-165.6		0.5	0.896	-112.	10.188	113.2	0.039	36.0	0.395	-154.6	
1.0	0.870	-152.5	5.742	86.6	0.048	23.1	0.547	-179.8		1.0	0.861	-154.0	5.962	84.6	0.047	19.8	0.442	-171.7	
1.5	0.765	-170.0	4.782	72.1	0.064	19.6	0.439	166.2		1.5	0.760	-171.3	4.853	70.1	0.060	16.8	0.319	177.2	
2.0	0.750	169.6	3.721	55.6	0.072	13.1	0.445	154.7		2.0	0.748	168.6	3.767	53.3	0.066	10.5	0.326	165.5	
2.5	0.735	152.7	3.092	40.9	0.080	6.1	0.435	144.6		2.5	0.735	152.1	3.119	38.2	0.072	4.7	0.318	156.6	
3.0	0.723	137.1	2.697	26.0	0.090	-1.9	0.420	133.7		3.0	0.724	136.7	2.707	23.3	0.080	-1.6	0.303	147.2	
3.5	0.722	119.8	2.411	10.4	0.101	-10.8	0.399	120.3		3.5	0.725	119.5	2.413	7.7	0.089	-9.6	0.281	135.1	
4.0	0.721	101.3	2.140	-6.9	0.110	-22.6	0.401	101.6		4.0	0.724	101.0	2.147	-9.5	0.096	-19.9	0.274	115.1	
4.5	0.744	82.8	1.849	-23.5	0.113	-33.8	0.433	81.3		4.5	0.746	82.6	1.863	-26.3	0.100	-30.0	0.299	91.3	
5.0	0.781	66.2	1.577	-38.8	0.113	-45.0	0.495	65.4		5.0	0.785	66.1	1.605	-42.2	0.102	-40.0	0.364	73.1	
5.5	0.812	52.3	1.353	-52.7	0.110	-55.3	0.550	54.0		5.5	0.817	52.3	1.388	-56.5	0.102	-49.7	0.428	61.2	
6.0	0.830	40.0	1.174	-65.7	0.109	-64.7	0.582	44.3		6.0	0.835	40.0	1.206	-70.0	0.102	-59.0	0.471	51.4	