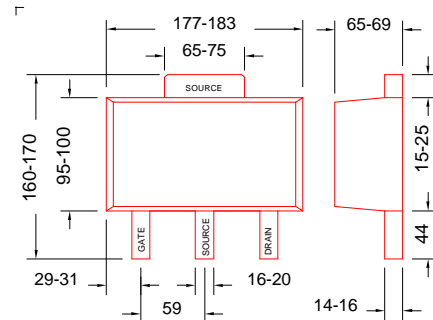


**PRELIMINARY DATA SHEET**
**DC-4GHz**
**Low Distortion GaAs Power FET**
**Features**

- **LOW COST SURFACE-MOUNT PLASTIC PACKAGE**
- **+28.0dBm TYPICAL OUTPUT POWER**
- **14.0dB TYPICAL POWER GAIN AT 2GHz**
- **0.7dB TYPICAL NOISE FIGURE AT 2GHz**
- **+42dBm 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 V <sub>ds</sub> =7V, I <sub>ds</sub> =180mA f = 2GHz	26.5	28.0		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>ds</sub> =7V, I <sub>ds</sub> =180mA f = 2GHz	12.0	14.0		dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>ds</sub> =7V, I <sub>ds</sub> =180mA f = 2GHz		45		%
<b>NF</b>	Noise Figure V <sub>ds</sub> =5V, I <sub>ds</sub> =75mA V <sub>ds</sub> =5-7V, I <sub>ds</sub> =180mA f = 2GHz		0.7 1.2		dB
<b>IP3</b>	Output 3rd Order Intercept Point V <sub>ds</sub> =5-7V, I <sub>ds</sub> =180mA V <sub>ds</sub> =5V, I <sub>ds</sub> =75mA f = 2GHz		42 33		dBm
<b>I<sub>dss</sub></b>	Saturated Drain Current V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	220	340	440	mA
<b>G<sub>m</sub></b>	Transconductance V <sub>ds</sub> =3V, V <sub>gs</sub> =0V	140	180		mS
<b>V<sub>p</sub></b>	Pinch-off Voltage V <sub>ds</sub> =3V, I <sub>ds</sub> =3mA		-2.0	-3.5	V
<b>BV<sub>gd</sub></b>	Drain Breakdown Voltage I <sub>gd</sub> =1.2mA	-11	-15		V
<b>BV<sub>gs</sub></b>	Source Breakdown Voltage I <sub>gs</sub> =1.2mA	-7	-14		V
<b>R<sub>th</sub></b>	Thermal Resistance		43*		°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>	390mA
<b>I<sub>gsf</sub></b>	Forward Gate Current	30mA	5mA
<b>P<sub>in</sub></b>	Input Power	26dBm	@ 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	3.2 W	2.7 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.

# EFA120D-SOT89

## PRELIMINARY DATA SHEET Low Distortion GaAs Power FET

DC-4GHz

### S-PARAMETERS

5V, 75mA									7V, 180mA								
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	0.974	-17.9	13.178	168.4	0.010	60.8	0.101	-48.3	0.1	0.988	-18.5	13.317	168.2	0.017	83.2	0.191	-33.8
0.2	0.983	-35.1	12.865	157.8	0.022	69.6	0.155	-78.1	0.2	0.990	-34.6	12.905	158.0	0.020	71.4	0.203	-52.2
0.3	0.969	-51.2	12.209	147.6	0.030	63.9	0.199	-94.1	0.3	0.981	-50.5	12.292	147.9	0.030	64.1	0.225	-71.4
0.4	0.955	-65.9	11.496	138.5	0.039	54.6	0.240	-108.2	0.4	0.974	-65.4	11.665	138.3	0.037	56.5	0.251	-86.8
0.5	0.942	-79.0	10.720	129.8	0.045	49.7	0.272	-118.3	0.5	0.958	-78.3	10.901	129.7	0.043	49.6	0.270	-98.8
1.0	0.865	-126.8	7.356	97.3	0.063	26.6	0.361	-151.1	1.0	0.867	-127.0	7.393	96.7	0.060	25.1	0.311	-137.9
1.5	0.742	-142.0	5.973	82.1	0.080	20.0	0.220	-155.8	1.5	0.772	-142.2	5.984	81.2	0.075	18.8	0.192	-131.4
2.0	0.706	-167.6	4.781	62.6	0.087	8.9	0.225	-179.9	2.0	0.712	-167.8	4.755	61.3	0.081	7.5	0.174	-157.6
2.5	0.681	171.4	4.029	45.6	0.095	-0.7	0.222	163.7	2.5	0.688	169.6	4.027	43.8	0.089	-2.0	0.174	-171.2
3.0	0.657	151.4	3.532	29.1	0.104	-10.4	0.210	148.2	3.0	0.667	149.4	3.515	26.8	0.095	-11.7	0.157	172.8
3.5	0.648	129.1	3.169	11.6	0.112	-21.5	0.202	127.5	3.5	0.653	127.5	3.159	9.3	0.103	-21.9	0.135	152.4
4.0	0.665	104.9	2.812	-6.5	0.118	-33.4	0.218	100.6	4.0	0.673	102.8	2.804	-9.2	0.107	-33.5	0.135	115.7
4.5	0.704	81.9	2.443	-24.7	0.119	-45.7	0.276	73.7	4.5	0.712	81.5	2.430	-27.0	0.109	-44.7	0.180	75.4
5.0	0.755	63.3	2.080	-41.3	0.116	-57.4	0.356	54.0	5.0	0.762	63.3	2.093	-43.6	0.107	-55.7	0.258	52.4
5.5	0.796	49.1	1.769	-56.1	0.110	-67.6	0.437	39.0	5.5	0.802	48.8	1.789	-59.0	0.102	-65.1	0.347	37.1
6.0	0.826	36.7	1.520	-70.2	0.105	-76.9	0.496	26.8	6.0	0.827	35.5	1.556	-73.1	0.099	-73.7	0.413	27.0