

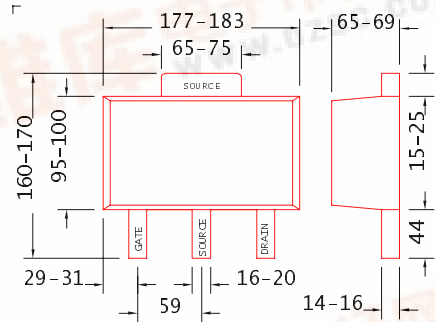


EPA240D-SOT89

DATA SHEET DC-6GHz High Efficiency Heterojunction Power FET

Features

- LOW COST SURFACE-MOUNT PLASTIC PACKAGE
- +33dBm TYPICAL OUTPUT POWER
- 14.0dB TYPICAL POWER GAIN AT 2GHz
- 0.4dB TYPICAL NOISE FIGURE AT 2GHz
- +40dBm TYPICAL OUTPUT 3rd ORDER INTERCEPT POINT AT 2GHz
- 0.4 X 2400 MICRON RECESSED “MUSHROOM” GATE
- Si₃N₄ PASSIVATION
- ADVANCED EPITAXIAL HETEROJUNCTION PROFILE PROVIDES EXTRA HIGH POWER EFFICIENCY AND HIGH RELIABILITY



(Top View)
All Dimensions In Mils

Applications

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

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOLS	PARAMETERS/TEST CONDITIONS	MIN	TYP	MAX	UNIT
P _{1dB}	Output Power at 1dB Compression f = 2GHz V _{ds} =8V, I _{ds} =350mA	31.5	33.0		dBm
G _{1dB}	Gain at 1dB Compression f = 2GHz V _{ds} =8V, I _{ds} =350mA	12.0	14.0		dB
PAE	Power Added Efficiency at 1dB Compression f = 2GHz V _{ds} =8V, I _{ds} =350mA		55		%
NF	Noise Figure f = 2GHz V _{ds} =5V, I _{ds} =150mA V _{ds} =5V, I _{ds} =350mA		0.4 0.8		dB
IP3	Output 3rd Order Intercept Point f = 2GHz V _{ds} =5-8V, I _{ds} =350mA V _{ds} =5V, I _{ds} =150mA		40 38		dBm
I _{dss}	Saturated Drain Current V _{ds} =3V, V _{gs} =0V	440	720	940	mA
G _m	Transconductance V _{ds} =3V, V _{gs} =0V	480	760		mS
V _p	Pinch-off Voltage V _{ds} =3V, I _{ds} =6mA		-1.0	-2.5	V
BV _{gd}	Drain Breakdown Voltage I _{gd} =2.4mA	-11	-15		V
BV _{gs}	Source Breakdown Voltage I _{gs} =2.4mA	-7	-14		V
R _{th}	Thermal Resistance		25*		°C/W

* Overall R_{th} depends on case mounting.

MAXIMUM RATINGS AT 25°C

SYMBOLS	PARAMETERS	ABSOLUTE ¹	CONTINUOUS ²
V _{ds}	Drain-Source Voltage	12V	8V
V _{gs}	Gate-Source Voltage	-8V	-3V
I _{ds}	Drain Current	I _{dss}	570mA
I _{gsf}	Forward Gate Current	120mA	20mA
P _{in}	Input Power	30dBm	@ 3dB Compression
T _{ch}	Channel Temperature	175°C	150°C
T _{stg}	Storage Temperature	-65/175°C	-65/150°C
P _t	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.

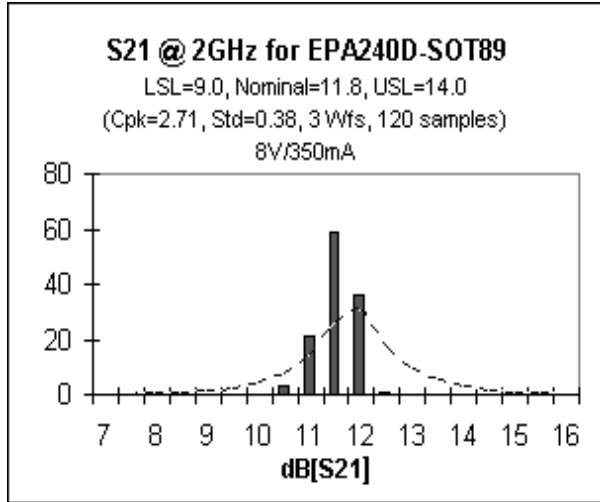
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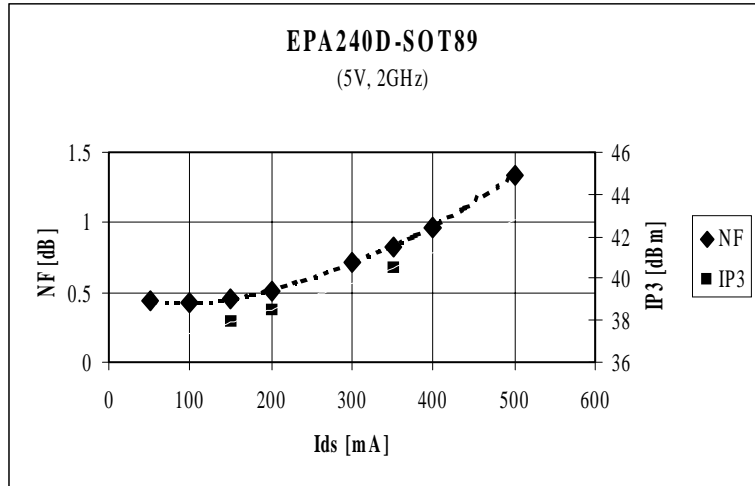
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Typical Performance

S21 Distribution



Noise Figure & IP3



S-PARAMETERS

S-PARAMETERS

8V, 350mA										5V, 150mA									
FREQ (GHz)	S11		S21		S12		S22			FREQ (GHz)	S11		S21		S12		S22		
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG			MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
0.1	0.905	-80.2	40.502	134.6	0.018	56.7	0.397	-114.3		0.1	0.874	-73.6	36.578	140.1	0.024	32.5	0.371	-136.7	
0.2	0.864	-117.6	26.481	114.1	0.025	33.5	0.494	-143.0		0.2	0.903	-113.7	25.627	118.3	0.024	38.5	0.507	-147.1	
0.3	0.861	-137.2	19.078	103.0	0.024	28.7	0.510	-155.1		0.3	0.887	-135.1	18.754	106.3	0.025	31.5	0.548	-158.5	
0.4	0.860	-149.8	14.721	95.6	0.026	26.6	0.528	-163.2		0.4	0.877	-148.4	14.600	98.4	0.027	27.0	0.569	-165.9	
0.5	0.856	-158.0	11.930	90.2	0.027	25.5	0.533	-169.2		0.5	0.870	-157.0	11.886	92.5	0.029	26.1	0.579	-171.7	
1.0	0.849	178.4	6.110	71.2	0.032	24.5	0.524	177.1		1.0	0.855	178.6	6.137	73.2	0.034	24.2	0.576	174.7	
1.5	0.780	161.3	4.969	57.7	0.047	24.4	0.409	162.2		1.5	0.781	161.6	5.042	59.5	0.050	23.3	0.469	159.3	
2.0	0.777	146.9	3.783	43.8	0.056	21.1	0.407	152.0		2.0	0.775	147.1	3.852	45.8	0.060	19.7	0.467	148.8	
2.5	0.767	133.6	3.113	30.5	0.066	15.5	0.395	143.0		2.5	0.763	133.6	3.177	32.6	0.071	13.4	0.453	139.2	
3.0	0.756	120.0	2.687	16.4	0.078	7.8	0.377	132.7		3.0	0.752	120.0	2.748	18.5	0.083	5.8	0.436	128.1	
3.5	0.760	104.2	2.371	1.2	0.089	-1.2	0.354	120.2		3.5	0.755	104.3	2.427	3.5	0.094	-4.1	0.413	115.2	
4.0	0.756	87.3	2.078	-15.3	0.098	-13.5	0.358	101.7		4.0	0.751	87.4	2.126	-13.0	0.104	-16.2	0.418	97.0	
4.5	0.780	70.9	1.777	-31.4	0.103	-24.6	0.392	81.7		4.5	0.775	70.9	1.815	-28.9	0.108	-28.0	0.453	78.2	
5.0	0.815	56.0	1.516	-46.2	0.105	-35.6	0.456	66.5		5.0	0.810	56.1	1.543	-43.5	0.108	-39.2	0.513	63.4	
5.5	0.845	43.5	1.296	-59.8	0.105	-45.9	0.510	56.0		5.5	0.841	43.6	1.318	-56.7	0.107	-49.3	0.563	53.0	
6.0	0.859	32.0	1.118	-72.4	0.104	-55.2	0.543	46.7		6.0	0.854	32.2	1.137	-69.1	0.105	-58.9	0.592	43.6	
6.5	0.864	21.8	0.978	-84.3	0.098	-63.7	0.569	36.2		6.5	0.860	22.0	0.995	-80.6	0.100	-67.3	0.616	33.2	
7.0	0.877	11.6	0.870	-97.1	0.094	-71.0	0.599	23.9		7.0	0.873	11.8	0.886	-93.1	0.094	-74.5	0.642	21.2	
7.5	0.888	0.2	0.760	-111.0	0.088	-74.8	0.624	10.9		7.5	0.885	0.5	0.776	-106.6	0.087	-78.0	0.662	8.2	
8.0	0.864	-10.7	0.623	-123.5	0.097	-78.4	0.645	-1.3		8.0	0.863	-10.6	0.639	-118.7	0.095	-80.8	0.677	-3.9	
8.5	0.854	-18.9	0.520	-132.5	0.100	-93.6	0.682	-10.0		8.5	0.852	-18.7	0.536	-127.7	0.100	-95.5	0.710	-12.2	
9.0	0.861	-24.6	0.445	-140.4	0.087	-109.6	0.723	-16.6		9.0	0.861	-24.5	0.457	-135.3	0.086	-111.9	0.747	-18.5	
9.5	0.879	-28.9	0.384	-147.6	0.076	-119.7	0.739	-21.3		9.5	0.878	-28.6	0.397	-142.2	0.077	-121.5	0.762	-23.0	
10.0	0.884	-31.7	0.336	-156.2	0.059	-139.2	0.741	-23.9		10.0	0.882	-31.5	0.346	-150.4	0.059	-142.6	0.756	-25.6	