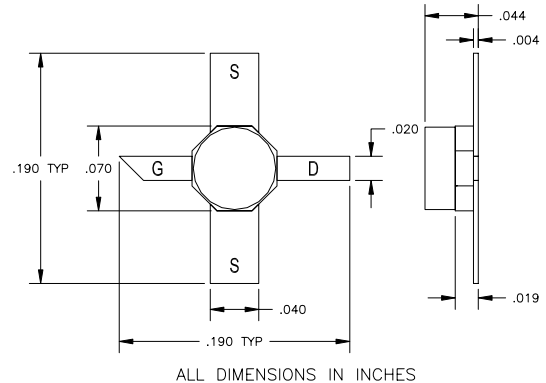


## High Efficiency Heterojunction Power FET

### FEATURES

- NON-HERMETIC LOW COST CERAMIC 70MIL PACKAGE
- +25.5 dBm OUTPUT POWER AT 1dB COMPRESSION
- 7.0 dB POWER GAIN AT 12GHz
- 0.3 x 800 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



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



Caution! ESD sensitive device.

SYMBOL	PARAMETERS/TEST CONDITIONS <sup>1</sup>	MIN	TYP	MAX	UNITS
<b>P<sub>1dB</sub></b>	Output Power at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz f = 18GHz	21.5	23.5 23.5		dBm
<b>G<sub>1dB</sub></b>	Gain at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz f = 18GHz	9.0	10.5 7.0		dB
<b>PAE</b>	Power Added Efficiency at 1dB Compression V <sub>DS</sub> = 6V, I <sub>DS</sub> ≈ 50% I <sub>DSS</sub> f = 12GHz		45		%
<b>I<sub>DSS</sub></b>	Saturated Drain Current V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V	70	120	160	mA
<b>G<sub>M</sub></b>	Transconductance V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 V	80	130		mS
<b>V<sub>P</sub></b>	Pinch-off Voltage V <sub>DS</sub> = 3 V, I <sub>DS</sub> = 1.0 mA		-1.0	-2.5	V
<b>BV<sub>GD</sub></b>	Drain Breakdown Voltage I <sub>GD</sub> = 1.0mA	-9	-15		V
<b>BV<sub>GS</sub></b>	Source Breakdown Voltage I <sub>GS</sub> = 1.0mA	-6	-14		V
<b>R<sub>TH</sub></b>	Thermal Resistance		250*		°C/W

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

### MAXIMUM RATINGS AT 25°C

SYMBOL	PARAMETERS	ABSOLUTE <sup>1</sup>	CONTINUOUS <sup>2</sup>
V <sub>DS</sub>	Drain to Source Voltage	10 V	6 V
V <sub>GS</sub>	Gate to Source Voltage	-6 V	-3 V
I <sub>DS</sub>	Drain Current	I <sub>DSS</sub>	75 mA
I <sub>GSF</sub>	Forward Gate Current	20 mA	3 mA
P <sub>IN</sub>	Input Power	20 dBm	@ 3dB compression
P <sub>T</sub>	Total Power Dissipation	550mW	455mW
T <sub>CH</sub>	Channel Temperature	175°C	150°C
T <sub>STG</sub>	Storage Temperature	-65/+175°C	-65/+150°C

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.

Specifications are subject to change without notice.



# EPA040A-70

UPDATED 11/22/2004

## High Efficiency Heterojunction Power FET

S-PARAMETERS								
6V, 1/2 Idss								
FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.948	-35.2	9.101	150.6	0.021	70.0	0.643	-17.1
2.0	0.846	-66.9	7.892	124.5	0.035	55.8	0.585	-33.4
3.0	0.753	-93.4	6.667	103.2	0.043	44.7	0.538	-46.2
4.0	0.676	-118.2	5.797	84.5	0.049	36.8	0.503	-55.8
5.0	0.620	-140.9	5.131	67.6	0.053	30.8	0.459	-65.0
6.0	0.584	-158.2	4.584	52.4	0.056	27.7	0.417	-77.2
7.0	0.552	-177.3	4.133	37.4	0.059	23.8	0.401	-88.6
8.0	0.527	165.1	3.768	23.5	0.060	21.8	0.370	-97.7
9.0	0.540	139.6	3.473	8.3	0.066	20.1	0.363	-107.1
10.0	0.567	119.0	3.201	-7.1	0.072	13.6	0.348	-122.4
11.0	0.573	105.6	3.058	-21.8	0.080	7.2	0.338	-143.5
12.0	0.596	89.7	2.916	-37.2	0.088	-0.9	0.344	-163.9
13.0	0.668	73.3	2.662	-52.4	0.092	-10.0	0.329	176.9
14.0	0.717	58.9	2.395	-66.9	0.094	-19.8	0.337	157.9
15.0	0.731	44.4	2.248	-83.7	0.097	-32.4	0.382	134.6
16.0	0.748	28.6	2.067	-101.6	0.095	-46.9	0.411	110.5
17.0	0.744	18.0	1.835	-114.4	0.093	-52.3	0.405	96.9
18.0	0.772	8.9	1.768	-127.1	0.101	-70.2	0.471	85.8
19.0	0.784	-7.3	1.597	-143.9	0.086	-85.7	0.503	68.2
20.0	0.809	-20.0	1.484	-160.4	0.081	-101.5	0.551	52.0
21.0	0.788	-29.3	1.401	-175.3	0.081	-116.7	0.549	38.9
22.0	0.747	-41.8	1.337	170.2	0.082	-133.9	0.538	29.7
23.0	0.762	-59.5	1.218	152.4	0.083	-153.9	0.515	10.7
24.0	0.772	-73.4	1.100	133.5	0.088	-173.7	0.502	-11.8
25.0	0.693	-89.6	1.067	116.8	0.103	169.3	0.529	-25.6
26.0	0.679	-111.5	1.065	98.2	0.130	151.4	0.500	-42.5

Specifications are subject to change without notice.

Excelics Semiconductor, Inc. 310 De Guigne Drive, Sunnyvale, CA 94085  
 Phone: 408-737-1711 Fax: 408-737-1868 Web: [www.excelics.com](http://www.excelics.com)

page 2 of 2  
 Revised November 2004