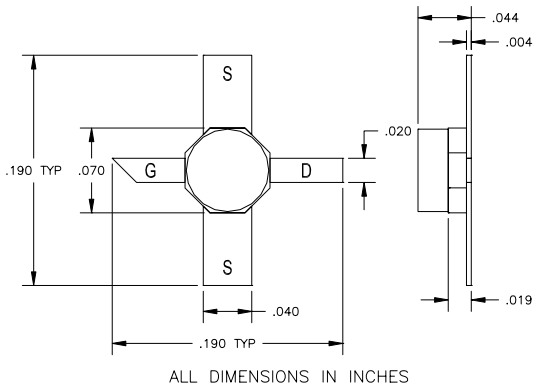
EFA025A-70

Low Distortion GaAs Power FET

UPDATED 04/28/2006

FEATURES

- None-Hermetic Low Cost Ceramic 70mil Package
- +20.0 dBm Output Power at 1dB Compression
- 10.0 dB Power Gain at 12GHz
- 7.0 dB Power Gain at 18GHz
- Typical 1.50 dB Noise Figure and 10.0 dB Associated Gain at 12GHz
- 0.3 x 250 Micron Recessed "Mushroom" Gate
- Si_3N_4 Passivation
- Advanced Epitaxial Heterojunction Profile Provides High Power Efficiency, Linearity and Reliability



Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETERS/TEST CONDITIONS[1]		MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Compression V_{DS} = 6V, I_{DS} ≈ 50% I_{DSS}	f = 12GHz f = 18GHz	17.0	20.0 20.0		dBm
G_{1dB}	Gain at 1dB Compression V_{DS} = 6V, I_{DS} ≈ 50% I_{DSS}	f = 12GHz f = 18GHz	8.5	10.0 7.0		dB
PAE	Power Added Efficiency at 1dB Compression V_{DS} = 6V, I_{DS} ≈ 50% I_{DSS}	f = 12GHz		35		%
NF	Noise Figure V_{DS} = 3V, I_{DS} = 15mA	f = 12GHz		1.5		dB
GA	Associate Gain V_{DS} = 3V, I_{DS} = 15mA	f = 12GHz		10		dB
I_{DSS}	Saturated Drain Current	V_{DS} = 3 V, V_{GS} = 0 V	35	65	105	mA
G_M	Transconductance	V_{DS} = 3 V, V_{GS} = 0 V	30	40		mS
V_P	Pinch-off Voltage	V_{DS} = 3 V, I_{DS} = 1.0 mA		-2.0	-3.5	V
BV_{GD}	Drain Breakdown Voltage	I_{GD} = 1.0mA	-10	-15		V
BV_{GS}	Source Breakdown Voltage	I_{GS} = 1.0mA	-6	-14		V
R_{TH}	Thermal Resistance			370*		°C/W

Notes: * Overall Rth depends on case mounting.

MAXIMUM RATINGS AT 25°C

SYMBOL	CHARACTERISTIC	VALUE
V_{DS}	Drain to Source Voltage	6 V
V_{GS}	Gate to Source Voltage	-4 V
I_{DS}	Drain Current	52 mA
I_{GSF}	Forward Gate Current	1 mA
P_{IN}	Input Power	@ 3dB compression
P_T	Total Power Dissipation	310 mW
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-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.

S-PARAMETERS

VDS = 3V, IDS ≈ 15mA

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	1.020	-17.0	4.385	159.6	0.030	75.6	0.549	-22.5
2.0	0.956	-37.8	3.291	142.6	0.043	64.4	0.611	-28.0
3.0	0.911	-56.4	3.114	125.5	0.060	52.4	0.601	-41.2
4.0	0.867	-73.0	2.944	109.6	0.072	42.4	0.577	-52.4
5.0	0.814	-89.2	2.856	93.8	0.084	32.3	0.535	-63.9
6.0	0.748	-105.5	2.697	78.2	0.089	22.3	0.514	-78.5
7.0	0.689	-124.2	2.523	64.0	0.092	14.6	0.511	-85.8
8.0	0.656	-144.7	2.424	49.6	0.096	6.5	0.489	-92.9
9.0	0.636	-151.0	2.334	36.0	0.098	-2.9	0.384	-111.2
10.0	0.584	-166.5	2.283	21.7	0.096	-4.4	0.390	-131.4
11.0	0.545	164.8	2.150	7.2	0.095	-10.8	0.432	-132.6
12.0	0.552	142.3	2.040	-5.8	0.095	-15.2	0.409	-133.6
13.0	0.589	134.6	1.982	-20.5	0.102	-21.4	0.351	-168.6
14.0	0.563	120.6	1.877	-36.0	0.100	-31.0	0.371	162.5
15.0	0.571	96.0	1.672	-50.1	0.096	-35.6	0.387	166.7
16.0	0.607	73.2	1.625	-63.4	0.098	-41.9	0.374	168.3
17.0	0.625	77.3	1.617	-78.1	0.108	-49.6	0.392	116.3
18.0	0.618	58.5	1.411	-92.5	0.105	-58.9	0.476	108.4
19.0	0.643	42.1	1.361	-102.2	0.109	-68.8	0.428	110.5
20.0	0.691	26.8	1.329	-116.0	0.103	-80.6	0.411	101.9
21.0	0.653	22.4	1.294	-135.8	0.105	-95.7	0.539	62.8
22.0	0.634	13.4	1.160	-146.5	0.103	-105.5	0.620	64.2
23.0	0.655	-8.1	1.172	-161.2	0.110	-120.8	0.479	61.0
24.0	0.646	-25.3	1.170	178.6	0.119	-141.1	0.478	34.5
25.0	0.563	-39.9	1.074	160.7	0.118	-159.4	0.624	17.3
26.0	0.596	-47.4	1.048	149.8	0.132	-169.1	0.562	15.8

S-PARAMETERS

VDS = 3V, IDS ≈ ½ Idss

FREQ (GHz)	--- S11 ---		--- S21 ---		--- S12 ---		--- S22 ---	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.0	0.985	-18.8	3.482	161.4	0.013	76.6	0.803	-11.3
2.0	0.953	-38	3.329	142.7	0.025	65.9	0.786	-24.1
3.0	0.913	-56	3.108	125.5	0.031	54.2	0.768	-36
4.0	0.872	-73.2	2.97	109.5	0.037	46.2	0.755	-45.6
5.0	0.825	-89.3	2.867	94.3	0.04	38.8	0.731	-54.5
6.0	0.779	-102.7	2.713	79.7	0.04	34.4	0.703	-66.2
7.0	0.734	-117.1	2.559	65.3	0.039	30.9	0.685	-76.8
8.0	0.688	-130.5	2.448	52.1	0.033	33.5	0.66	-85.6
9.0	0.642	-152.3	2.42	37.6	0.037	44.6	0.661	-91.4
10.0	0.614	-173.2	2.355	21.8	0.044	48.1	0.654	-102.2
11.0	0.591	177.4	2.312	8.6	0.054	50.4	0.642	-117.7
12.0	0.572	163.7	2.282	-5.4	0.071	50.2	0.641	-131.9
13.0	0.598	138.2	2.188	-22	0.086	40.5	0.638	-144.4
14.0	0.631	115.4	2.036	-38.8	0.097	29.4	0.642	-158.9
15.0	0.631	102.2	1.97	-54.9	0.112	18.3	0.667	179.8
16.0	0.634	87.3	1.909	-72.4	0.126	5.6	0.685	158.4
17.0	0.658	70.3	1.685	-87.7	0.128	-2.1	0.665	145.1
18.0	0.694	59	1.58	-99.5	0.15	-17.2	0.731	132.5
19.0	0.672	42	1.467	-116.1	0.137	-30.5	0.761	113.1
20.0	0.707	25.5	1.399	-132.9	0.143	-43.3	0.836	96.6
21.0	0.761	14.9	1.29	-148.4	0.143	-56.3	0.826	84.7
22.0	0.736	3.9	1.184	-161.3	0.138	-68.7	0.83	76
23.0	0.703	-15.3	1.103	-178.5	0.134	-84.6	0.824	58.8
24.0	0.723	-33.5	1.043	162.6	0.134	-101.6	0.841	41.2
25.0	0.705	-44.7	1.017	146.3	0.14	-117.8	0.843	28.4
26.0	0.676	-59.8	1.017	131.8	0.156	-131	0.831	16.6

NOISE-PARAMETERS

VDS = 3V, IDS ≈ 15mA

FREQ (GHz)	Gamma Opt		Nfmin (dB)	Rn/50
	MAG	ANG		
2	0.83	28	0.53	0.58
4	0.75	59	0.65	0.48
6	0.65	85	0.85	0.33
8	0.58	128	1.05	0.21
10	0.45	147	1.35	0.11
12	0.40	-170	1.55	0.10
14	0.41	-111	1.90	0.27
16	0.47	-69	2.25	0.58
18	0.53	-44	2.60	1.00
20	0.62	-14	2.90	1.38
22	0.57	1	3.20	1.68
24	0.59	39	3.50	1.77
26	0.57	66	3.80	1.10