

**Product Specifications**
May 1994

(1 of 2)

General Purpose
GaAs FETs**Features**

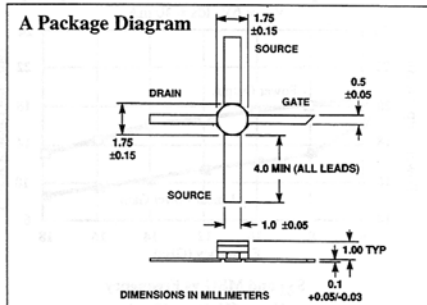
- High Gain
- 19 dBm Power Output
- Ion Implanted Material
- 70 Mil Hermetic Package

Applications

- Satellites
- Point-to-Point Radios
- Commercial Communications
- Defense Electronics

Description

The CFA0101-G series is a family of high-gain FETs ideally suited for high performance gain block applications. Manufactured in Celeritek's proprietary 0.25 micron ion-implanted process, this family of devices is assembled in an industry standard 70 mil hermetic package.



This family of high reliability devices is ideally suited for operation-critical applications where reliability and performance are required.

Specifications (TA = 25°C)

Parameter	Bias		Frequency (GHz)	Units	Performance Specifications			
	Vds (V)	Ids (mA)			Grade	Min	Typ	Max
P _{1dB}	6.0	40.0	12.0	dBm	G1	19.0	19.5	—
					G2	18.0	18.5	—
					G3	17.0	17.5	—
G _L	6.0	40.0	12.0	dB	G1	9.0	9.5	—
					G2	9.0	9.5	—
					G3	8.0	8.5	—
S ₂₁ ²	6.0	40.0	2.0	dB			14.0	—
			10.0	dB			8.7	—
			18.0	dB			5.1	—
NF _{opt}	6.0	40.0	12.0	dB			2.8	—
g _m	Vds = 3.0V	Vgs = 0V		mS			60.0	—
I _{dss}	Vds = 3.0V	Vgs = 0V		mA		40.0	60.0	120.0
V _p	Vds = 3.0V	Ids = 1mA		Volts		-0.7	-1.3	-2.5
BV _{gd}	Igd = 100 μA			Volts		-5.5	-8.0	—
R _{th}				°C/W			250	—

Absolute Maximum Ratings

Parameter	Symbol	Rating
Drain-Source Voltage	Vds	8V
Gate-Source Voltage	Vgs	-5V
Drain Current	Ids	Idss
Continuous Dissipation	Pt	800 mW
RF Power In	Pin	+17 dBm
Channel Temperature	Tch	175°C
Storage Temperature	Tstg	-65°C to +175°C

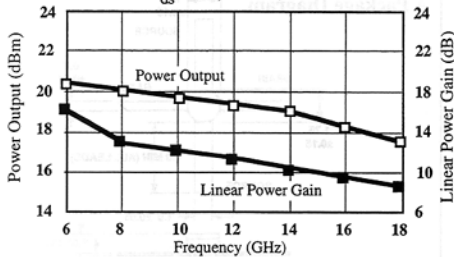
Typical Noise Parameters (Vds = 6V, Ids = 40 mA)

Freq (GHz)	NF _{opt}	G _A (dB)	Gamma Mag	Opt Ang	Rn/50
2.0	0.94	21.5	0.81	39	1.57
4.0	1.18	17.6	0.66	78	0.67
6.0	1.46	15.3	0.56	115	0.19
8.0	1.82	13.7	0.51	151	0.04
10.0	2.35	12.5	0.48	-175	0.14
12.0	2.87	11.6	0.48	-140	0.42
14.0	3.29	10.9	0.50	-105	0.78
16.0	3.70	10.3	0.51	-69	1.16
18.0	4.00	9.9	0.53	-32	1.46

Typical Performance (TA = 25°C)

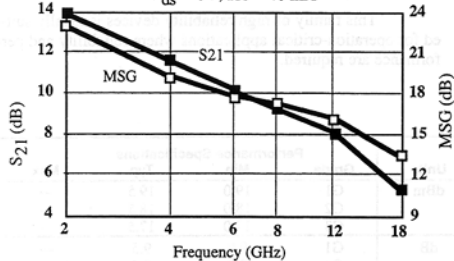
Power Output and Linear Power Gain vs Frequency

$V_{ds} = 6V, I_{ds} = 40 mA$



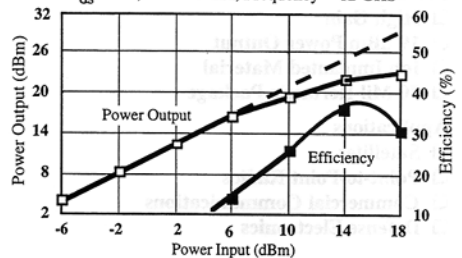
S₂₁ and MSG vs Frequency

$V_{ds} = 6V, I_{ds} = 40 mA$



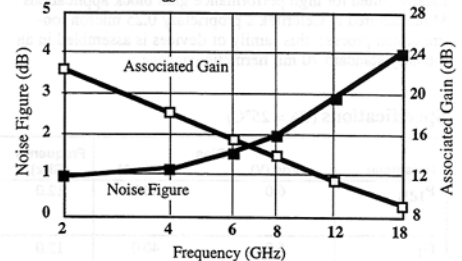
Power Output and Power Added Efficiency vs Power In

$V_{ds} = 6V, I_{ds} = 40 mA, \text{Frequency} = 12 GHz$



Noise Figure and Associated Gain vs Frequency

$V_{ds} = 6V, I_{ds} = 40 mA$



Typical Scattering Parameters (TA = 25°C, $V_{ds} = 6V, I_{ds} = 40mA$)

CFA0101

Frequency (GHz)	S ₁₁		S ₂₁			S ₁₂			S ₂₂		MSG (dB)
	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(Mag)	(Ang)	
2.0	0.95	-37	14.0	5.01	145	-32.4	0.02	59	0.55	-17	23.2
4.0	0.84	-80	11.9	3.94	106	-27.4	0.04	40	0.58	-45	19.7
6.0	0.75	-114	10.4	3.31	75	-25.6	0.05	26	0.58	-64	18.0
8.0	0.63	-157	9.9	3.13	44	-24.7	0.06	12	0.51	-76	17.3
10.0	0.61	165	8.7	2.72	12	-24.2	0.06	-3	0.41	-113	16.5
12.0	0.59	135	8.0	2.51	-16	-23.4	0.07	-4	0.50	-138	15.7
14.0	0.60	94	7.1	2.26	-48	-22.1	0.08	-20	0.49	-167	14.6
16.0	0.61	71	5.9	1.97	-79	-21.4	0.09	-38	0.62	157	13.7
18.0	0.57	41	5.1	1.80	-111	-21.7	0.08	-60	0.68	139	13.4

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