

**Product Specifications**
May 1994

(1 of 2)

Low-Noise GaAs FETs**Features**

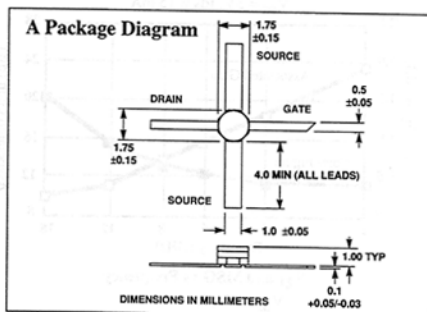
- ☐ High Gain
- ☐ Super Low-Noise
- ☐ Pseudomorphic HEMT
- ☐ 70 Mil Hermetic Package

Applications

- ☐ Satellite Receivers
- ☐ Point-to-Point Radio Receivers
- ☐ Commercial Communications
- ☐ Defense Electronics

Description

The CFA0103-L series is a family of low-noise, high-gain FETs intended for satellite and point-to-point radio receiver applications. Manufactured in Celeritek's proprietary, state-of-the-art PHEMT process and assembled in an industry



standard, 70 mil hermetic package, this high reliability family of devices is ideally suited for operation-critical applications where reliability and performance are required.

Specifications (TA = 25°C)

Parameter	Vds (V)	Bias Ids (mA)	Frequency (GHz)	Units	Performance Specifications			
					Grade	Min	Typ	Max
NF _{opt}	3.0	15.0	12.0	dB	L1	—	0.7	0.8
					L2	—	0.9	1.0
					L3	—	0.9	1.2
G _a	3.0	15.0	12.0	dB	L1	10.0	11.0	—
					L2	10.0	11.0	—
					L3	8.0	9.0	—
S ₂₁ ²	3.0	15.0	2.0	dB			13.0	
			10.0	dB			9.6	
			18.0	dB			7.2	
P _{1dB}	6.0	40.0	12.0	dBm			19.0	
g _m	Vds = 3.0V	Vgs = 0V		mS			90.0	
I _{dss}	Vds = 3.0V	Vgs = 0V		mA		30.0	60.0	120.0
V _p	Vds = 3.0V	Ids = 1mA		Volts		-0.5	-1.3	-2.5
BV _{gd}	Igd = 100 μA			Volts		-5.5	-8.0	
R _{th}				°C/W			250	

Absolute Maximum Ratings

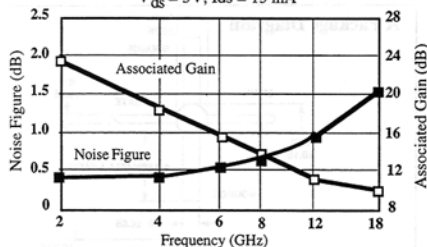
Parameter	Symbol	Rating
Drain-Source Voltage	Vds	8V
Gate-Source Voltage	Vgs	-5V
Drain Current	Ids	Idss
Continuous Dissipation	Pt	800mW
RF Power In	Pin	+17 dBm
Channel Temperature	Tch	175°C
Storage Temperature	Tstg	-65°C to +175°C

Typical Noise Parameters (Vds = 3V, Ids = 15 mA)

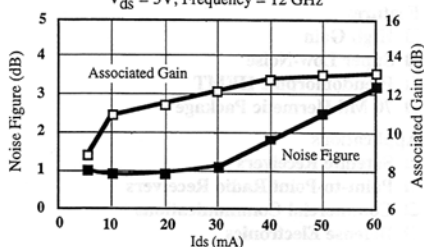
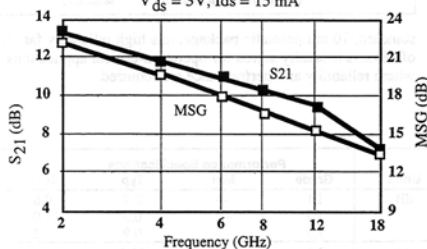
Freq (GHz)	NF _{opt}	G _a (dB)	Gamma Mag	Opt Ang	Rn/50
2.0	0.39	23.6	0.87	36	0.42
4.0	0.47	18.3	0.77	71	0.34
6.0	0.57	15.2	0.69	100	0.27
8.0	0.69	13.0	0.63	124	0.22
10.0	0.84	11.5	0.58	147	0.18
12.0	1.00	10.6	0.53	171	0.16
14.0	1.18	10.1	0.49	-163	0.15
16.0	1.38	9.9	0.46	-132	0.16
18.0	1.60	9.8	0.42	-94	0.18

Typical Performance (TA = 25°C)

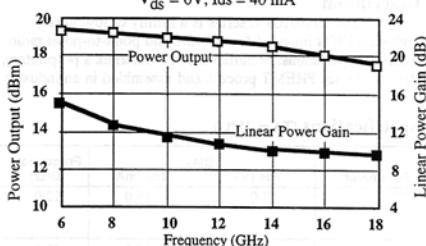
Noise Figure and Associated Gain vs Frequency

 $V_{ds} = 3V$, $I_{ds} = 15mA$ 

Noise Figure and Associated Gain vs Ids

 $V_{ds} = 3V$, Frequency = 12 GHz S_{21} and MSG vs Frequency $V_{ds} = 3V$, $I_{ds} = 15mA$ 

Power Output and Linear Power Gain vs Frequency

 $V_{ds} = 6V$, $I_{ds} = 40mA$ Typical Scattering Parameters (TA = 25°C, $V_{ds} = 3V$, $I_{ds} = 15mA$)

CFA0103

Frequency (GHz)	S_{11}		S_{21}			S_{12}			S_{22}		MSG
	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(Mag)	(Ang)	(dB)
2.0	0.97	-32	13.5	4.73	149	-31.1	0.03	69	0.56	-22	22.3
4.0	0.88	-69	11.9	3.94	113	-25.8	0.05	45	0.55	-50	18.9
6.0	0.79	-96	10.7	3.43	84	-23.6	0.07	27	0.54	-70	17.1
8.0	0.66	-129	10.6	3.39	55	-22.0	0.08	10	0.46	-84	16.3
10.0	0.59	-170	9.6	3.02	22	-21.4	0.09	-13	0.36	-121	15.5
12.0	0.57	162	9.0	2.82	-4	-21.6	0.08	-21	0.42	-138	15.3
14.0	0.57	123	8.5	2.66	-35	-21.0	0.09	-40	0.35	-166	14.8
16.0	0.57	104	7.7	2.43	-66	-20.9	0.09	-56	0.47	151	14.3
18.0	0.51	80	7.2	2.29	-100	-21.3	0.09	-79	0.59	128	14.3

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