

Low Noise GaAs FETs

July 2006 - Rev 31-Jul-06

CFA0103

Features

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

Applications

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

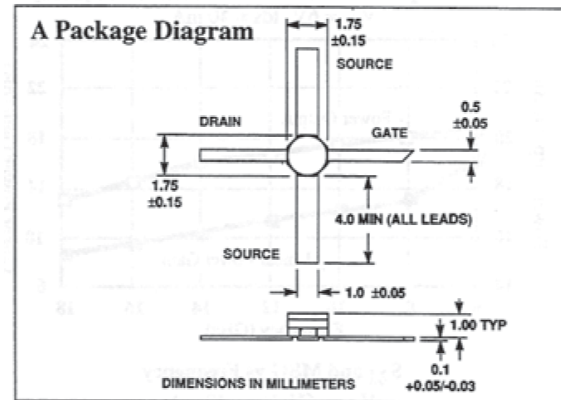
General Description

The CFA0103-L series is a family of low noise, high-gain FETs intended for satellite and point-to-point radio receiver applications. 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.

Typical Noise Parameters

($V_{ds} = 3V$, $I_{ds} = 15\text{ mA}$)

Freq (GHz)	NF _{opt}	G _A (dB)	Gamma Opt		Rn/50
			Mag	Ang	
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



Absolute Maximum Ratings

Drain-Source Voltage (V_{ds})	8 V
Gate-Source Voltage (V_{gs})	-5 V
Drain Current (I_{ds})	I_{dss}
Continuous Dissipation (Pt)	800 mW
RF Power In (P_{in})	+17 dBm
Channel Temperature (T_{ch})	175 °C
Storage Temperature (T_{stg})	-65 °C to +175 °C

Electrical Characteristics (Ambient Temperature $T = 25\text{ °C}$)

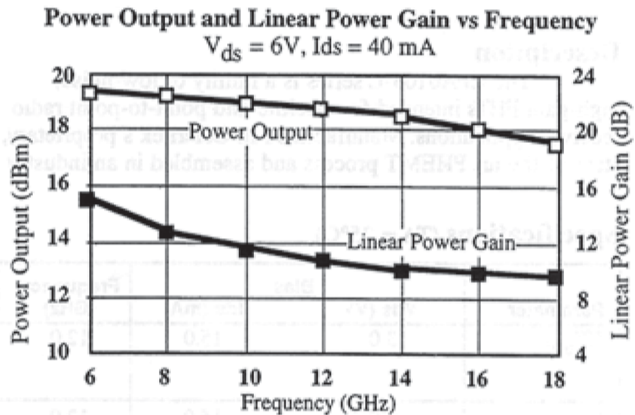
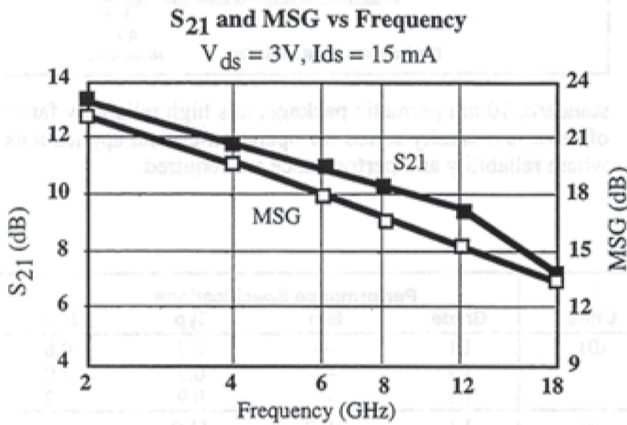
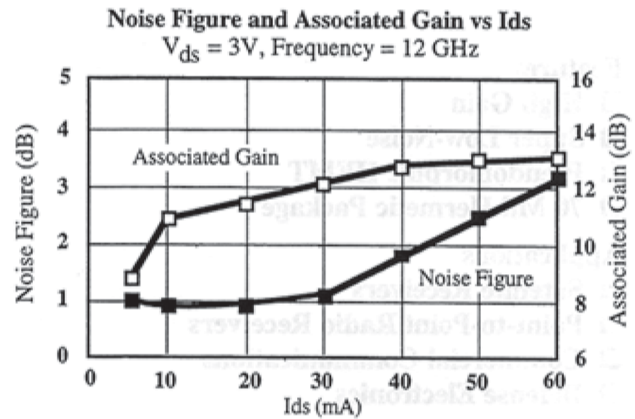
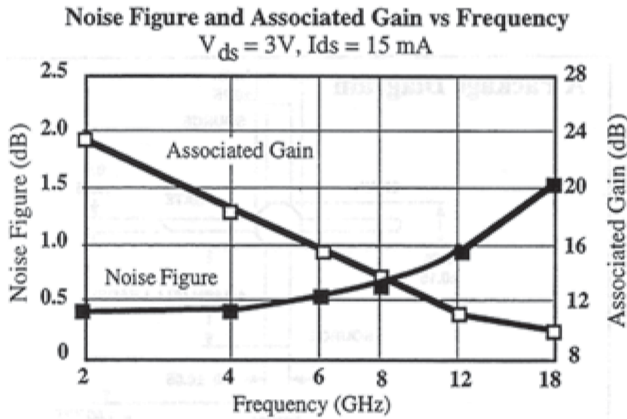
Parameter	Bias		Frequency (GHz)	Units	Grade	Min	Typ	Max
	V_{ds} (V)	I_{ds} (mA)						
NF _{opt}	3.0	15.0	12.0	dB	L1	-	0.7	0.8
					L2	-	0.9	1.0
					L3	-	0.9	1.2
G _A	3.0	15.0	12.0	dB	L1	10.0	11.0	-
					L2	10.0	11.0	-
					L3	8.0	9.0	-
IS211 ²	3.0	15.0	2.0	dB			13.0	
			10.0	dB			9.6	
			18.0	dB			7.2	
P1dB	6.0	40.0	12.0	dBm			19.0	
gm	$V_{ds} = 3.0V$ $V_{gs} = V$			mS			90.0	
I_{dss}	$V_{ds} = 3.0V$ $V_{gs} = 0V$			mA		30.0	60.0	120.0
V _p	$V_{ds} = 3.0V$ $I_{ds} = 1\text{ mA}$			Volts		-0.5	-1.3	-2.5
BV _{gd}	$I_{gd} = 100\text{ uA}$			Volts		-5.5	-8.0	
R _{th}				°C/W			250	

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Typical Performance (TA = 25°C)



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

Frequency (GHz)	S ₁₁ (Mag) (Ang)	S ₂₁ (dB) (Mag) (Ang)	S ₁₂ (dB) (Mag) (Ang)	S ₂₂ (Mag) (Ang)	MSG (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	-21.4 0.08 10	0.46 -84	16.3
10.0	0.59 -170	9.6 3.02 22	-21.6 0.09 -13	0.36 -121	15.5
12.0	0.57 162	9.0 2.82 -4	-21.0 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