Product Specifications
May 1994

(1 of 2)

Medium Power GaAs FETs

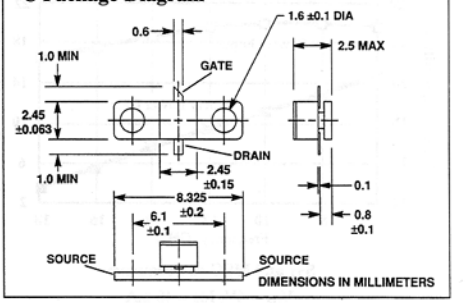
Features

- ❑ High Gain
- ❑ +23 dBm Power Output
- ❑ Ion Implanted Material
- ❑ 100 Mil Stripline Flange Package

Applications

- ❑ Point-to-Point Radios
- ❑ Satellites
- ❑ Commercial Applications
- ❑ Defense Electronics

C Package Diagram



Description

The CFC0301-P series is a family of high-gain FETs intended for driver amplifier applications in high-power systems, and output stage usage in medium power applications at power levels up to 0.25 watts. Manufactured in Celeritek's proprietary 0.25 micron ion-implanted process, this family of devices is assembled in an industry standard 100 mil flange package.

Specifications (TA = 25°C)

Parameter	Bias Vds (V)	Bias Ids (mA)	Frequency (GHz)	Units	Performance Specifications Grade	Min	Typ	Max
P_{1dB}	6.0	80.0	12.0	dBm	P1	22.5	23.0	—
					P2	22.0	22.5	—
					P3	21.5	22.5	—
G_L	6.0	80.0	12.0	dB	P1	9.5	10.0	—
					P2	9.0	9.5	—
					P3	8.0	9.0	—
$\|S_{21}\|^2$	6.0	80.0	2.0	dB			15.5	
			10.0	dB			7.6	
			18.0	dB			-1.1	
NF_{opt}	6.0	80.0	12.0	dB			2.6	
g_m	Vds = 3.0V	Vgs = 0V		mS			120	
I_{dss}	Vds = 3.0V	Vgs = 0V		mA		120	180	240
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			100	

Absolute Maximum Ratings

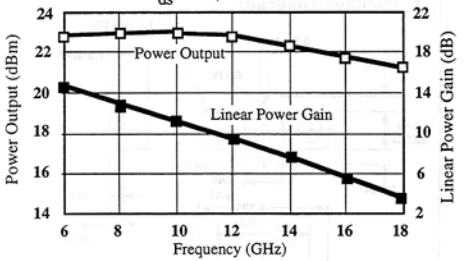
Parameter	Symbol	Rating
Drain-Source Voltage	Vds	8V
Gate-Source Voltage	Vgs	-5V
Drain Current	Ids	Idss
Continuous Dissipation	Pt	1.6W
RF Power In	Pin	+20 dBm
Channel Temperature	Tch	175°C
Storage Temperature	Tstg	-65°C to +175°C

Typical Noise Parameters (Vds = 6V, Ids = 80 mA)

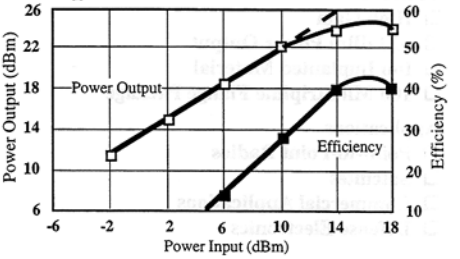
Freq (GHz)	NF_{opt}	G_A (dB)	Gamma Opt Mag	Gamma Opt Ang	Rn/50
2.0	0.34	18.4	0.88	56	0.65
4.0	0.72	18.4	0.80	103	0.43
6.0	1.11	14.8	0.73	143	0.30
8.0	1.55	13.0	0.65	179	0.24
10.0	2.06	11.2	0.58	-146	0.26
12.0	2.64	9.4	0.51	-112	0.36
14.0	3.28	7.6	0.46	-75	0.54
16.0	3.98	5.9	0.42	-34	0.79
18.0	4.75	4.2	0.40	14	1.12

Typical Performance (TA = 25°C)

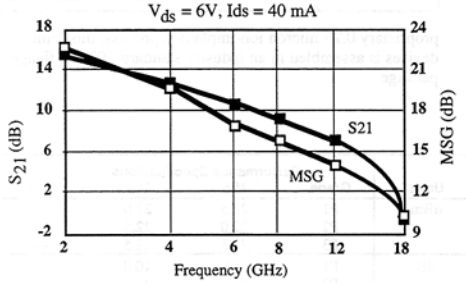
Power Output and Linear Power Gain vs Frequency
V_{ds} = 6V, Ids = 80 mA



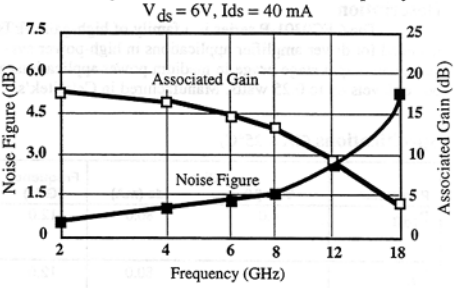
Power Output and Power Added Efficiency vs Power In
V_{ds} = 6V, Ids = 80 mA, Frequency = 12 GHz



S_{21} and MSG vs Frequency
V_{ds} = 6V, Ids = 40 mA



Noise Figure and Associated Gain vs Frequency
V_{ds} = 6V, Ids = 40 mA



Typical Scattering Parameters (TA = 25°C, Vds = 6V, Ids = 80mA)

CFC0301

Frequency (GHz)	S_{11} (Mag)	S_{11} (Ang)	S_{21} (dB)	S_{21} (Mag)	S_{21} (Ang)	S_{12} (dB)	S_{12} (Mag)	S_{12} (Ang)	S_{22} (Mag)	S_{22} (Ang)	MSG (dB)
2.0	0.90	-81	15.5	5.97	117	-30.5	0.03	45	0.37	-56	22.4
4.0	0.90	-131	12.7	4.30	76	-26.0	0.05	21	0.41	-86	19.5
6.0	0.70	-162	10.3	3.27	43	-26.0	0.05	3	0.42	-108	17.9
8.0	0.69	162	8.9	2.80	11	-24.4	0.06	-12	0.43	-129	16.7
10.0	0.67	129	7.6	2.40	-21	-24.4	0.06	-40	0.39	-151	15.8
12.0	0.62	98	7.1	2.27	-54	-21.9	0.08	-57	0.45	180	14.8
14.0	0.53	65	6.2	2.04	-92	-20.9	0.09	-91	0.50	148	13.5
16.0	0.35	39	4.4	1.66	-134	-20.0	0.10	-130	0.58	113	12.1
18.0	0.40	35	-1.1	0.88	-177	-21.9	0.08	159	0.65	72	10.5

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