# **Dual Gate GaAs FET Chip**

August 2006 - Rev 03-Aug-06



#### **Preliminary Product Information** May 1988 (1 of 2)

### Features

- □ Implanted Active Layer for Uniformity
- □ High Insertion Gain Useful to 20 GHz
- □ +16 dBm P1dB at 12 GHz
- □ Ti/Pt/Au Recessed Gates
- **Gilicon Nitride Passivation**
- All Gold Metal System

#### Description

The CF007-01 is a 300 micron gate width dual-gate GaAs FET with sub 0.5 micron recessed gates. It has high  $|S_{21}|^2$ and moderate output power which makes it suitable for gain and driver stages for wideband amplifiers in the 2 to 20 GHz frequency range. It is also useful for AGC and mixer applications. The accessibility of the intermediate electrode is useful in some applications. Silicon nitride passivation provides surface stabilization.

### **Chip Diagram** 420 50 50 50 Ŧ 250 50 s GI GI 50 5Ø 50 CF007 CHIP (Units in microns) Thickness: 110 microns

#### ELECTRICAL SPECIFICATIONS, $T_{A} = 25^{\circ}C$ , $V_{G2S} = 0V$

SYMBOL	PARAMETERS AND CONDITIONS	FREQ	UNITS	MIN	TYP	MAX
NFopt	Optimum Noise Figure at $V_{DS}$ =4V, $I_{DS}$ =25mA	12 GHz	dB		2.2	
Ga	Gain at NF <sub>opt</sub> at $V_{DS}$ =4V, $I_{DS}$ =25mA	12 GHz	dB		12.0	
S <sub>21</sub>   <sup>2</sup>	50 Ohm Insertion Gain at	2 GHz	dB		11.5	
	V <sub>DS</sub> =5.5V, I <sub>DS</sub> =40 mA	10 GHz	dB	ļ	7.4	
		18 GHz	dB		8.8	
P <sub>1dB</sub>	Power Output @ 1 dB Gain Compression at $V_{\rm DS}$ =5.5V, $I_{\rm DS}$ =40 mA	12 GHz	dBm		16.0	
g_	Transconductance at $V_{DS} = 3V$ , $V_{QS} = 0V$		mS		60	
IDSS	Drain Current at $V_{DS} = 3V$ , $V_{GS} = \emptyset V$		mA	40	60	120
VP	Pinchoff Voltage at $V_{DS} = 3V$ , $I_{DS} = 1 \text{ mA}$		v	-0.7	-1.3	-2.5
B∨ <sub>GD</sub>	Breakdown Voltage, Gate-to-Drain at $I_{GD} = 100 \ \mu R$		V	-5.5	-8.0	
R <sub>th</sub>	Thermal Resistance		° C/W		150	

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# **CF007-01**

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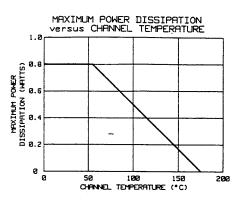
## **CF007-01**

### **Preliminary Product Information - May 1988**

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### Absolute Maximum Ratings

Parameter	Rating
Drain-Source Voltage, Vdss	8V
Gate-Source Voltage, V <sub>gs</sub>	-5V
Drain Current, I <sub>ds</sub>	ldss
Continuous Power Dissipation, Pt	800 mW
Channel Temperature, T <sub>ch</sub>	+175°C
Storage Temperature, T <sub>stg</sub>	-65°C to +175°C



### Typical Scattering Parameters, Common Source (S-Parameters including bonding wire parasitics)

	Bias = 4.0 Volts, 25.0 mA , $V_{G2S} = 0V$											
	S <sub>11</sub>		S <sub>11</sub> S <sub>21</sub>				S <sub>12</sub>		S <sub>22</sub>			MAG
GHz	Mag	Ang	dB	Mag	Ang	dB	Mag	Ang	Mag	Ang	к	dB
2	0.960	-14	11.8	3.890	161	-43.0	0.007	86	0.836	-2	0.51	_
4	0.899	-34	11.9	3.936	139	-38.0	0.013	82	0.802	-12	0.74	-
6	0.847	53	10.6	3.388	116	-37.6	0.013	84	0.795	-27	1.05	22.8
8	0.810	-59	8.9	2.786	102	-37.8	0.013	99	0.829	-35	1.23	20.5
10	0.768	-60	7.8	2.455	94	-36.9	0.014	120	0.842	-35	1.29	19.1
12	0.727	-61	7.6	2.399	87	-33.9	0.020	141	0.888	-30	0.55	-
14	0.659	-67	8.7	2.723	77	-31.0	0.028	142	0.872	-35	0.46	_
16	0.576	-89	9.5	2.985	54	-29.8	0.032	129	0.770	-55	1.08	17.9
18	0.613	-112	9.1	2.851	30	-27.8	0.040	123	0.903	-75	0.03	_
20	0.643	-117	8.3	2.600	11	-27.6	0.042	108	0.953	-99	-0.22	_
22	0.605	-128	7.7	2.427	-13	-24.8	0.058	78	0.866	-129	0.22	-
24	Ø.639	-139	5.3	1.841	-38	-21.5	0.084	53	0.901	-155	0.08	_
26	0.624	-129	2.1	1.274	-47	-21.8	0.081	15	0.765		1.36	8.3

#### Bias = 5.5 Volts, 40.0 mA, $V_{G2S} = 0V$ S 11 S<sub>21</sub> S<sub>12</sub> SZZ MAG GHz Mag Ang dB Mag Mag Ang dB Ang Mag Ang к dB 2 0.957 -16 11.5 3.758 159 -44.1 0.005 90 0.820 -2 0.62 \_ 0.896 -38 4 11.5 3.758 136 -38.8 0.011 89 0.790 -110.82 6 0.846 -58 10.2 3.236 -38.7 0.787 113 0.112 91 -25 1.25 21.4 8 0.810 -64 8.4 2.630 98 -37.9 0.013 111 0.825 -33 1.24 20.2 10 0.767 -66 7.4 2.344 89 -35.7 0.016 0.844 131 -33 1.07 19.9 0.729 12 -68 7.2 2.291 82 -32.8 0.023 148 Ø.896 -28 0.36 \_ 14 0.664 -76 8.3 2.600 71 -29.4 0.034 148 Ø.896 -31 0.19 \_ 16 0.602 -100 9.1 2.851 48 -28.5 0.038 135 Ø.797 -49 0.72 \_ 18 0.653 -121 8.8 2.754 24 -26.3 0.048 126 0.930 -69 -0.22 \_ 20 Ø.683 -125 \_ 8.2 2.570 5 -25.6 0.052 103 1.015 -92 -0.57 22 0.645 -135 2.455 7.8 -21 -23.1 0.070 77 0.937 --122 -0.13 24 0.669 -145 5.5 1.884 -48 -20.5 0.094 53 Ø.967 -149 -0.13 \_ 26 0.638 -133 2.1 1.274 -58 -20.7 0.092 17 0.802 -157 1.13 9.2

Specifications subject to change.

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CF007-01