

Broadband Power GaAs MESFET Chip

Mimix
BROADBAND™

August 2006 - Rev 03-Aug-06

CF015-11



CF015-11

Product Specifications December 1995 (1 of 1)

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Features

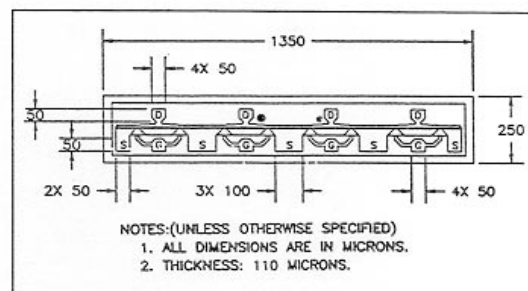
- ☐ P1dB Power: +26 dBm
- ☐ High Gain (@12 GHz): 8 dB
- ☐ Broadband: Usable to 18 GHz
- ☐ Wafer Qualification Procedure
- ☐ Customer Wafer Selection Available

Celeritek Broadband Power Chip

Celeritek's CF015-11 Medium Power Chip is a GaAs MESFET device with a 1200 μm gate width, 1/4 micron gate length, Celeritek's proprietary Silicon Nitride passivation, and is fabricated on ion implanted wafers.

Celeritek's Wafer Qualification Procedure for this device consists of DC, RF and reliability testing of both individual die in 6 to 18 GHz amplifier modules.

Celeritek's broadband power chips make up a family of GaAs FET devices which have high broadband gain and



provide up to 1 Watt in balanced 6 to 18 GHz amplifier circuits. These devices are also suitable for high power oscillators. In narrow band applications they offer superior associated gain.

These devices are available in chip form and are suitable for airborne, shipboard and ground-based equipment. Screening includes MIL-STD-750 Class B, Class S and commercial screening.

Absolute Maximum Ratings

Parameter	Rating	Parameter	Rating	Parameter	Rating
Drain-Source Voltage (V_{DS})	+10 V	Drain Current (I_{DS})	I_{DSS}	Channel Temperature	175°C
Gate-Source Voltage (V_{GS})	-5 V	Continuous Dissipation (Pt)	3.0 W	Storage Temperature	-65°C to +150°C

Specifications ($T_A = 25^\circ\text{C}$)

Symbol	Parameters and Conditions	Frequency (GHz)	Units	Min	Typ	Max
G_L	Linear Power Gain ($V_{DS} = 6.0\text{ V}$, $I_{DS} = 160\text{ mA}$)	12.0	dB	7.0	8.0	
P_{1dB}	Power Output @ 1 dB GC ($V_{DS} = 6.0\text{ V}$, $I_{DS} = 160\text{ mA}$)	12.0	dBm	25.0	26.0	
g_m	Transconductance ($V_{DS} = 3.0\text{ V}$, $V_{GS} = 0\text{ V}$)		mS		240	
I_{DSS}	Drain Current ($V_{DS} = 3.0\text{ V}$, $V_{GS} = 0\text{ V}$)		mA	180	310	380
V_P	Pinchoff Voltage ($V_{DS} = 3.0\text{ V}$, $I_{DS} = 1\text{ mA}$)		Volts	-1.2	-2.1	-3.0
BV_{GD}	Breakdown Voltage, Gate-Drain ($I_{GD} = 200\text{ }\mu\text{A}$)		Volts	-12	-18	
R_{th}	Thermal Resistance		°C/W		40	

Typical Scattering Parameters, Common Source (S-Parameters Include Bonding Wire Parasitics)

CF015-11 ($T_A = 25^\circ\text{C}$, $V_{DS} = 6\text{ V}$, $I_{DS} = 80\text{ mA}$)

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)	K	MSG (dB)
2.0	0.91	-93	16.5	6.67	123	-25.9	0.05	44	0.26	-131	0.21	21.2
4.0	0.86	-136	12.5	4.19	96	-24.1	0.06	28	0.34	-148	0.37	18.3
6.0	0.83	-157	9.4	2.95	78	-23.8	0.06	20	0.41	-155	0.54	16.6
8.0	0.82	-171	7.0	2.24	66	-24.3	0.06	18	0.43	-156	0.82	15.7
10.0	0.84	179	5.1	1.80	56	-24.8	0.06	20	0.45	-154	0.97	14.9
12.0	0.85	171	3.5	1.49	46	-25.1	0.06	22	0.48	-154	1.03	14.2
14.0	0.86	164	2.0	1.26	36	-24.9	0.06	21	0.52	-157	1.11	13.5
16.0	0.87	157	0.7	1.09	26	-25.1	0.06	19	0.54	-161	1.07	12.9
18.0	0.89	150	-0.4	0.96	16	-24.5	0.06	13	0.57	-169	0.95	12.1

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