

Broadband Power GaAs MESFET Chip



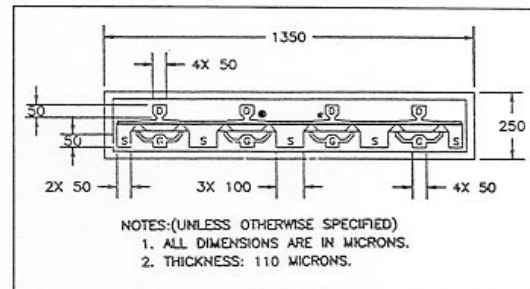
CF015-11

Product Specifications
December 1995 (1 of 1)

Broadband Power GaAs MESFET Chip

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°C)

Symbol	Parameters and Conditions	Frequency (GHz)	Units	Min	Typ	Max
G _L	Linear Power Gain (V _{DS} = 6.0 V, I _{DS} = 160 mA)	12.0	dB	7.0	8.0	
P _{1dB}	Power Output @ 1 dB GC (V _{DS} = 6.0 V, I _{DS} = 160 mA)	12.0	dBm	25.0	26.0	
g _m	Transconductance (V _{DS} = 3.0 V, V _{GS} = 0 V)		mS		240	
I _{DSS}	Drain Current (V _{DS} = 3.0 V, V _{GS} = 0 V)		mA	180	310	380
V _P	Pinchoff Voltage (V _{DS} = 3.0 V, I _{DS} = 1 mA)		Volts	-1.2	-2.1	-3.0
BV _{GD}	Breakdown Voltage, Gate-Drain (I _{GD} = 200 μA)		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°C, V_{ds} = 6V, I_{ds} = 80mA)

Frequency (GHz)	S ₁₁			S ₂₁			S ₁₂		S ₂₂		K	MSG (dB)
	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(Mag)	(Ang)		
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