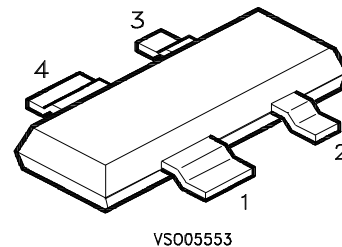


Preliminary Datasheet

Features

- low noise pseudomorphic HEMT with high associated gain
- low cost plastic package
- for low noise front end amplifiers up to 20 GHz
- For DBS down converters
- Fully RF tested at 12 GHz



- 1 = source
- 2 = drain
- 3 = source
- 4 = gate

ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering Code (taped)	Package
CFH120-06	H5s	Q62705-K0671	MW-4
CFH120-08	H3s	Q62705-K0603	MW-4
CFH120-10	H4s	Q62705-K0604	MW-4

Maximum Ratings

Characteristics	Symbol	Max. Value	Unit
Drain-source voltage	V_{DS}	3.0	V
Drain-gate voltage	V_{DG}	4.0	V
Gate-source voltage	V_{GS}	-2.0	V
Drain current	I_D	40	mA
Channel temperature	T_{Ch}	150	°C
Operating temperature	T_{op}	-30 ... +85	°C
Storage temperature range	T_{stg}	-65 ... +150	°C
Total power dissipation ($T_s \leq 51^\circ\text{C}$) 1)	P_{tot}	180	mW
Thermal resistance			
Channel-soldering point source	R_{thChS}	690	K/W

1) T_s : Temperature measured at soldering point

Electrical Characteristics

unless otherwise specified:

$$T_a = 25^{\circ}\text{C};$$

$$V_{DD} = 2\text{V},$$

$$f_{RF} = 12.0\text{GHz};$$

$$Z_S = \Gamma_{opt}, Z_L = S_{22}^*;$$

Characteristics	Symbol	min	typ	max	Unit
Drain-source saturation current $V_{DS} = 2\text{V}$ $V_{GS} = 0\text{V}$	I_{DSS}	0	15	35	mA
Pinch-off voltage $V_{DS} = 2\text{V}$ $I_D = 120\text{ }\mu\text{A}$	$V_{GS(P)}$	-0.9	-0.5	0.0	V
Gate leakage current $V_{DS} = 2\text{V}$ $I_D = 10\text{ mA}$	I_G	-	0.05	2	μA
Transconductance $V_{DS} = 2\text{V}$ $I_D = 10\text{ mA}$	g_m	-	60	-	mS
Noise figure* $V_{DS} = 2\text{V}$ $I_D = 10\text{ mA}$ $f = 12\text{ GHz}$	F	-	0.50	0.60	dB
CFH120-06					
CFH120-08					
CFH120-10					
Associated gain* $V_{DS} = 2\text{V}$ $I_D = 10\text{ mA}$ $f = 12\text{ GHz}$	G_a	11.5	12.5	-	dB
CFH120-06					
CFH120-08					
CFH120-10					

*** IMPORTANT NOTE:**

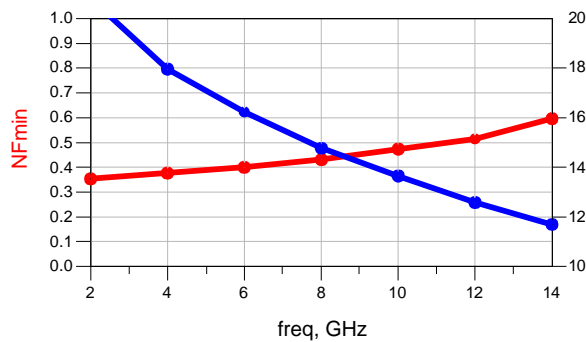
During production, the DC and RF parameters of all devices are tested according to the specification table above.

Typical Measured Data CFH120-06

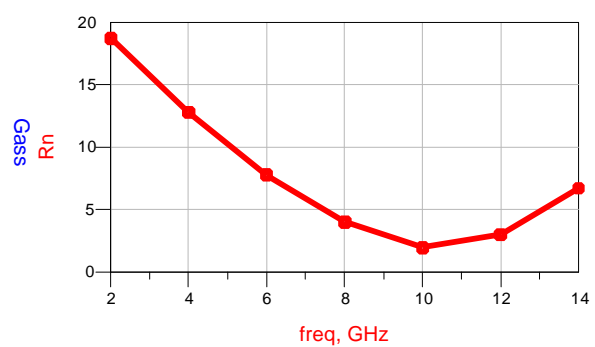
Common Source Noise – Parameters ($V_{DD}=2V$, $I_D=10mA$, $Z_0=50\Omega$)

Freq [GHz]	F_{min} [dB]	G_a [dB]	G_{opt}		R_n/Z_0
			Mag	Phase	
2.0	0.35	20.8	0.842	27.2	0.375
4.0	0.38	17.9	0.720	55.0	0.256
6.0	0.40	16.2	0.612	82.6	0.155
8.0	0.43	14.8	0.499	126.8	0.080
10.0	0.47	13.7	0.413	-173.1	0.039
12.0	0.51	12.6	0.450	-120.8	0.060
14.0	0.60	11.7	0.582	-90.9	0.134

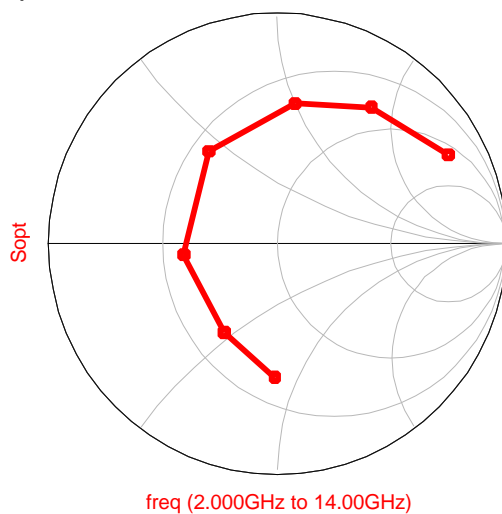
Noise figure/associated gain @ Γ_{opt}



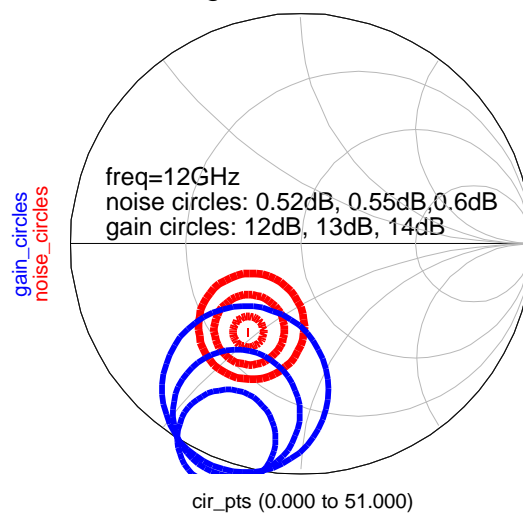
Equivalent noise resistance



Optimum source reflection coefficient



Noise and gain circles at 12GHz



Typical Measured Data CFH120-06

Common Source S – Parameters ($V_{DD}=2V$, $I_D=0mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.955	-12.5	0.047	34.4	0.044	40.1	0.963	-10.9
1.5	0.949	-16.6	0.055	38.5	0.052	42.7	0.964	-15.0
2.0	0.943	-22.5	0.068	41.0	0.067	43.7	0.964	-20.7
2.5	0.943	-28.0	0.083	40.2	0.082	42.3	0.962	-26.1
3.0	0.941	-33.6	0.098	37.5	0.097	39.5	0.958	-31.5
3.5	0.939	-39.7	0.114	34.3	0.112	35.6	0.952	-37.0
4.0	0.934	-46.1	0.130	30.1	0.128	32.1	0.947	-42.6
4.5	0.928	-52.3	0.145	25.7	0.144	27.3	0.945	-48.3
5.0	0.921	-58.0	0.161	20.9	0.161	22.1	0.948	-54.4
5.5	0.915	-63.5	0.178	16.1	0.178	16.7	0.943	-60.5
6.0	0.910	-69.3	0.198	10.9	0.195	11.4	0.932	-66.8
6.5	0.903	-75.7	0.218	5.0	0.215	5.6	0.919	-73.4
7.0	0.891	-83.1	0.238	-1.8	0.236	-0.5	0.910	-80.3
7.5	0.876	-91.3	0.255	-9.3	0.257	-7.9	0.907	-87.6
8.0	0.866	-99.3	0.272	-16.7	0.277	-15.5	0.904	-95.6
8.5	0.854	-107.3	0.292	-24.4	0.295	-23.8	0.891	-104.2
9.0	0.850	-115.5	0.312	-32.5	0.311	-32.1	0.872	-112.8
9.5	0.844	-124.3	0.329	-41.0	0.325	-40.3	0.858	-121.5
10.0	0.831	-134.1	0.344	-50.4	0.342	-48.9	0.851	-130.7
10.5	0.814	-144.6	0.354	-60.1	0.357	-58.5	0.849	-140.6
11.0	0.798	-155.2	0.361	-70.2	0.367	-69.5	0.844	-151.9
11.5	0.794	-166.2	0.367	-80.4	0.369	-80.6	0.833	-163.9
12.0	0.802	-177.7	0.367	-91.2	0.364	-91.4	0.830	-176.0
12.5	0.811	170.4	0.360	-102.7	0.353	-101.7	0.837	172.6
13.0	0.817	159.1	0.342	-113.6	0.341	-111.6	0.856	161.9
13.5	0.815	149.0	0.321	-123.3	0.327	-121.6	0.874	151.5
14.0	0.817	139.5	0.303	-132.4	0.309	-131.8	0.878	140.9
14.5	0.829	129.4	0.288	-141.7	0.288	-141.9	0.875	130.6
15.0	0.848	117.9	0.273	-152.1	0.266	-151.3	0.878	120.5
15.5	0.856	106.0	0.251	-163.1	0.248	-160.9	0.905	110.3
16.0	0.856	94.9	0.223	-173.7	0.227	-171.2	0.913	99.8
16.5	0.855	85.8	0.194	177.4	0.202	178.6	0.920	89.9
17.0	0.869	79.0	0.172	170.7	0.174	169.7	0.931	81.4
17.5	0.894	72.3	0.155	163.5	0.151	163.0	0.933	74.8
18.0	0.920	67.3	0.145	157.4	0.137	159.2	0.938	70.9

Typical Measured Data CFH120-06

Common Source S – Parameters ($V_{DD}=2V$, $I_D=5mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.980	-19.5	3.943	161.0	0.027	73.9	0.720	-14.7
1.5	0.974	-25.5	3.929	155.4	0.036	68.9	0.714	-19.7
2.0	0.963	-34.1	3.924	147.3	0.049	62.3	0.704	-26.9
2.5	0.952	-42.8	3.931	139.2	0.061	56.4	0.693	-34.0
3.0	0.936	-51.6	3.938	130.8	0.072	49.6	0.675	-41.1
3.5	0.921	-61.0	3.950	122.3	0.083	42.8	0.652	-48.3
4.0	0.899	-70.7	3.936	113.7	0.093	35.8	0.629	-55.6
4.5	0.876	-80.1	3.910	105.3	0.102	29.6	0.608	-63.1
5.0	0.851	-89.2	3.891	96.9	0.111	22.5	0.583	-71.1
5.5	0.827	-98.4	3.876	88.6	0.120	15.8	0.554	-79.0
6.0	0.800	-108.5	3.886	80.0	0.126	8.9	0.518	-87.6
6.5	0.768	-119.8	3.871	71.0	0.133	2.0	0.480	-96.9
7.0	0.735	-132.0	3.814	61.9	0.139	-5.2	0.444	-106.9
7.5	0.701	-144.3	3.715	52.7	0.143	-12.4	0.407	-117.4
8.0	0.677	-156.2	3.621	43.8	0.146	-19.9	0.373	-128.6
8.5	0.657	-168.3	3.542	34.8	0.146	-26.9	0.340	-140.5
9.0	0.642	179.1	3.476	25.5	0.146	-34.0	0.311	-153.4
9.5	0.625	166.5	3.360	16.4	0.144	-40.2	0.289	-167.1
10.0	0.610	153.9	3.225	7.6	0.140	-46.3	0.275	178.3
10.5	0.606	141.9	3.090	-0.6	0.137	-52.3	0.268	163.3
11.0	0.611	130.6	2.978	-8.7	0.132	-58.5	0.267	148.0
11.5	0.623	119.7	2.852	-17.0	0.126	-64.4	0.276	133.3
12.0	0.633	109.5	2.713	-25.4	0.120	-69.1	0.296	120.9
12.5	0.640	100.7	2.558	-33.2	0.114	-73.4	0.322	111.9
13.0	0.642	93.3	2.410	-40.1	0.109	-77.2	0.346	105.2
13.5	0.646	86.8	2.300	-46.6	0.105	-81.2	0.365	98.8
14.0	0.658	79.8	2.220	-53.3	0.100	-85.5	0.379	91.8
14.5	0.676	71.8	2.152	-60.6	0.095	-89.4	0.395	84.3
15.0	0.692	63.4	2.062	-68.4	0.090	-92.3	0.421	76.7
15.5	0.703	55.8	1.942	-76.1	0.085	-95.5	0.455	69.5
16.0	0.711	49.9	1.806	-82.6	0.080	-99.4	0.489	63.2
16.5	0.725	45.5	1.697	-88.1	0.075	-102.3	0.513	58.1
17.0	0.746	42.2	1.640	-93.2	0.070	-103.4	0.524	53.9
17.5	0.770	37.8	1.603	-99.3	0.066	-103.8	0.537	50.0
18.0	0.787	34.0	1.577	-104.1	0.065	-104.4	0.553	47.2

Typical Measured Data CFH120-06

Common Source S – Parameters ($V_{DD}=2V$, $I_D=10mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.981	-21.3	5.529	160.3	0.028	75.8	0.666	-15.8
1.5	0.966	-27.8	5.439	153.8	0.035	68.8	0.654	-21.1
2.0	0.950	-37.2	5.394	145.0	0.045	62.0	0.639	-28.9
2.5	0.935	-46.5	5.363	136.4	0.055	54.8	0.622	-36.4
3.0	0.912	-56.0	5.318	127.7	0.066	48.4	0.600	-44.0
3.5	0.891	-66.1	5.289	118.7	0.075	42.1	0.575	-51.5
4.0	0.864	-76.5	5.233	109.6	0.084	35.5	0.548	-59.4
4.5	0.835	-86.3	5.135	101.0	0.092	28.7	0.520	-67.3
5.0	0.806	-96.0	5.055	92.6	0.100	22.0	0.492	-75.3
5.5	0.775	-106.0	4.971	84.0	0.107	15.4	0.460	-83.5
6.0	0.744	-116.7	4.926	75.3	0.112	8.7	0.424	-92.6
6.5	0.709	-128.3	4.838	66.3	0.117	2.6	0.388	-102.7
7.0	0.676	-140.8	4.714	57.3	0.121	-3.8	0.350	-113.8
7.5	0.647	-153.3	4.541	48.3	0.123	-10.3	0.314	-125.5
8.0	0.625	-165.5	4.385	39.8	0.125	-16.7	0.281	-138.2
8.5	0.607	-177.9	4.245	31.1	0.125	-23.0	0.253	-152.0
9.0	0.593	169.4	4.120	22.2	0.125	-29.1	0.233	-166.9
9.5	0.583	156.7	3.949	13.7	0.124	-34.6	0.222	176.9
10.0	0.577	144.6	3.765	5.5	0.123	-40.1	0.221	160.2
10.5	0.579	133.1	3.594	-2.3	0.121	-45.2	0.226	144.4
11.0	0.590	122.2	3.445	-10.1	0.117	-50.5	0.238	128.9
11.5	0.605	111.9	3.297	-18.1	0.113	-55.6	0.258	115.4
12.0	0.620	102.4	3.135	-25.8	0.109	-59.7	0.287	104.7
12.5	0.630	94.3	2.949	-32.8	0.104	-63.2	0.316	97.3
13.0	0.634	87.5	2.782	-39.0	0.102	-66.7	0.340	91.7
13.5	0.640	81.2	2.665	-45.2	0.100	-70.3	0.356	86.2
14.0	0.652	74.4	2.582	-51.6	0.096	-73.7	0.370	80.0
14.5	0.672	66.6	2.494	-58.8	0.093	-76.5	0.388	73.4
15.0	0.691	58.4	2.382	-66.4	0.089	-79.6	0.416	66.6
15.5	0.703	51.3	2.235	-73.4	0.087	-83.5	0.452	60.2
16.0	0.711	45.8	2.085	-79.6	0.083	-87.4	0.484	54.6
16.5	0.723	42.1	1.972	-84.6	0.079	-90.0	0.504	50.1
17.0	0.745	39.0	1.918	-89.7	0.075	-92.0	0.512	46.5
17.5	0.768	34.6	1.880	-95.6	0.072	-93.2	0.523	42.8
18.0	0.783	31.0	1.861	-100.4	0.071	-94.1	0.537	39.9

Typical Measured Data CFH120-06

Common Source S – Parameters ($V_{DD}=2V$, $I_D=15mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.979	-21.9	6.294	159.2	0.026	72.8	0.648	-16.4
1.5	0.965	-28.8	6.231	152.7	0.033	68.1	0.636	-21.9
2.0	0.946	-38.5	6.155	143.6	0.043	61.5	0.619	-29.7
2.5	0.927	-48.2	6.097	134.8	0.053	54.8	0.599	-37.6
3.0	0.901	-57.9	6.034	125.9	0.062	47.4	0.576	-45.3
3.5	0.877	-68.2	5.990	116.8	0.072	41.2	0.547	-53.2
4.0	0.848	-78.7	5.892	107.9	0.080	34.4	0.518	-61.2
4.5	0.813	-88.8	5.745	99.1	0.087	28.0	0.490	-69.0
5.0	0.782	-98.7	5.616	90.5	0.094	21.6	0.460	-77.3
5.5	0.748	-108.8	5.506	81.9	0.100	15.9	0.426	-85.7
6.0	0.713	-119.6	5.425	73.3	0.106	9.7	0.389	-94.9
6.5	0.677	-131.5	5.309	64.5	0.111	3.4	0.352	-105.4
7.0	0.645	-144.1	5.147	55.5	0.114	-2.9	0.316	-117.0
7.5	0.616	-157.0	4.951	46.6	0.116	-8.9	0.282	-129.4
8.0	0.599	-169.3	4.762	38.3	0.118	-15.1	0.251	-142.8
8.5	0.585	178.6	4.590	29.8	0.118	-20.9	0.227	-157.5
9.0	0.574	166.1	4.438	21.2	0.118	-26.5	0.211	-173.8
9.5	0.564	153.7	4.248	12.8	0.117	-31.8	0.205	169.3
10.0	0.559	141.5	4.039	5.0	0.116	-37.0	0.208	152.2
10.5	0.566	130.1	3.849	-2.7	0.114	-41.6	0.219	136.3
11.0	0.577	119.7	3.678	-10.3	0.112	-47.0	0.237	121.6
11.5	0.595	109.3	3.516	-18.0	0.109	-51.8	0.261	109.0
12.0	0.613	100.0	3.333	-25.5	0.105	-56.0	0.291	99.3
12.5	0.623	92.0	3.129	-32.5	0.102	-59.3	0.320	92.5
13.0	0.628	85.4	2.957	-38.7	0.101	-62.5	0.343	87.3
13.5	0.634	79.5	2.841	-44.7	0.098	-65.8	0.360	82.0
14.0	0.647	72.8	2.744	-51.0	0.095	-69.4	0.374	76.1
14.5	0.666	65.2	2.662	-57.8	0.093	-72.6	0.393	69.7
15.0	0.687	57.2	2.552	-65.3	0.091	-75.6	0.421	63.1
15.5	0.698	50.2	2.402	-72.1	0.088	-79.1	0.456	57.1
16.0	0.707	44.9	2.249	-78.1	0.085	-83.1	0.488	51.6
16.5	0.720	41.3	2.126	-83.0	0.081	-86.2	0.507	47.3
17.0	0.743	38.0	2.061	-87.9	0.078	-88.1	0.514	43.8
17.5	0.765	33.7	2.024	-93.7	0.074	-89.2	0.524	40.2
18.0	0.779	30.1	2.004	-98.5	0.073	-89.8	0.536	37.4

Typical Measured Data CFH120-06

Common Source S – Parameters ($V_{DD}=2V$, $I_D=20mA$, $Z_0=50\Omega$)

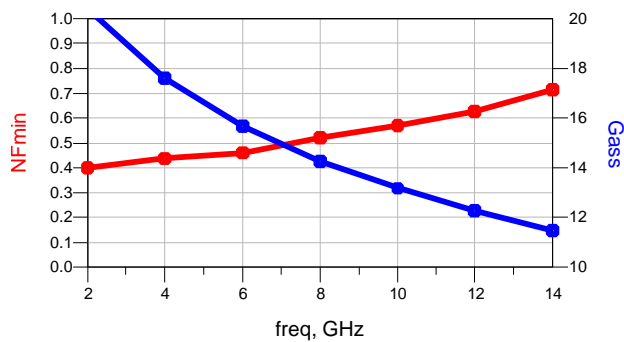
Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.975	-22.4	6.940	158.6	0.025	72.4	0.641	-16.9
1.5	0.957	-29.3	6.842	152.2	0.033	68.0	0.628	-22.5
2.0	0.937	-39.1	6.751	142.9	0.043	62.3	0.611	-30.5
2.5	0.918	-49.0	6.673	133.7	0.053	55.0	0.592	-38.6
3.0	0.892	-59.0	6.588	124.8	0.063	48.1	0.566	-46.5
3.5	0.863	-69.6	6.506	115.7	0.071	41.7	0.538	-54.5
4.0	0.831	-80.1	6.377	106.6	0.079	35.1	0.507	-62.4
4.5	0.797	-90.3	6.208	97.9	0.086	28.4	0.477	-70.5
5.0	0.764	-100.1	6.052	89.4	0.092	22.0	0.446	-78.9
5.5	0.731	-110.4	5.923	80.8	0.098	16.1	0.411	-87.3
6.0	0.696	-121.2	5.798	72.2	0.102	10.1	0.374	-96.7
6.5	0.658	-133.2	5.650	63.5	0.107	4.3	0.336	-107.3
7.0	0.625	-145.9	5.454	54.7	0.110	-1.8	0.299	-119.3
7.5	0.599	-158.6	5.236	45.9	0.112	-8.3	0.267	-132.1
8.0	0.581	-171.1	5.026	37.6	0.114	-14.0	0.239	-145.9
8.5	0.568	176.8	4.834	29.2	0.115	-19.4	0.217	-160.8
9.0	0.557	164.2	4.671	20.6	0.115	-24.6	0.203	-177.4
9.5	0.548	151.9	4.470	12.4	0.114	-29.7	0.200	165.3
10.0	0.545	139.9	4.242	4.8	0.113	-34.9	0.206	148.2
10.5	0.553	128.6	4.036	-2.7	0.111	-39.9	0.219	132.4
11.0	0.568	118.1	3.867	-10.0	0.109	-44.8	0.238	118.3
11.5	0.586	108.0	3.701	-17.6	0.106	-49.2	0.264	106.3
12.0	0.602	98.8	3.509	-25.1	0.104	-52.8	0.295	96.7
12.5	0.613	91.0	3.299	-32.1	0.101	-56.4	0.324	90.2
13.0	0.618	84.6	3.125	-38.2	0.099	-59.6	0.347	85.1
13.5	0.625	78.7	2.994	-43.9	0.097	-62.6	0.364	80.0
14.0	0.640	71.9	2.891	-50.2	0.096	-66.4	0.378	74.3
14.5	0.660	64.5	2.800	-57.0	0.093	-70.0	0.396	68.0
15.0	0.679	56.7	2.690	-64.3	0.091	-73.5	0.424	61.5
15.5	0.690	49.8	2.533	-71.2	0.089	-76.9	0.460	55.4
16.0	0.699	44.5	2.367	-77.0	0.086	-80.5	0.491	50.0
16.5	0.714	40.8	2.242	-81.9	0.082	-84.1	0.510	45.9
17.0	0.737	37.7	2.184	-86.9	0.077	-85.9	0.515	42.5
17.5	0.759	33.4	2.148	-92.7	0.075	-87.4	0.525	38.9
18.0	0.775	29.9	2.126	-97.3	0.074	-88.6	0.538	36.2

Typical Measured Data CFH120-08

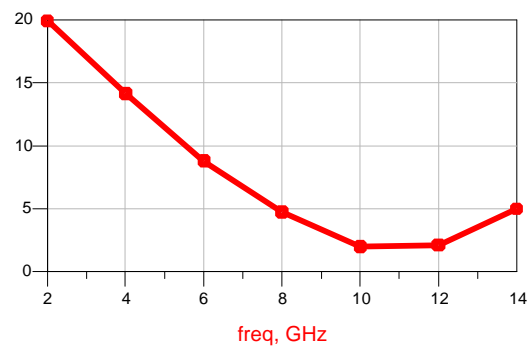
Common Source Noise – Parameters ($V_{DD}=2V$, $I_D=10mA$, $Z_0=50\Omega$)

Freq [GHz]	F_{min} [dB]	G_a [dB]	G_{opt}		R_n/Z_0
			Mag	Phase	
2.0	0.40	20.4	0.875	26.8	0.399
4.0	0.44	17.6	0.761	56.0	0.283
6.0	0.46	15.7	0.623	82.3	0.176
8.0	0.52	14.3	0.499	124.8	0.095
10.0	0.57	13.2	0.413	-178.1	0.040
12.0	0.63	12.3	0.450	-120.8	0.042
14.0	0.71	11.5	0.582	-90.9	0.099

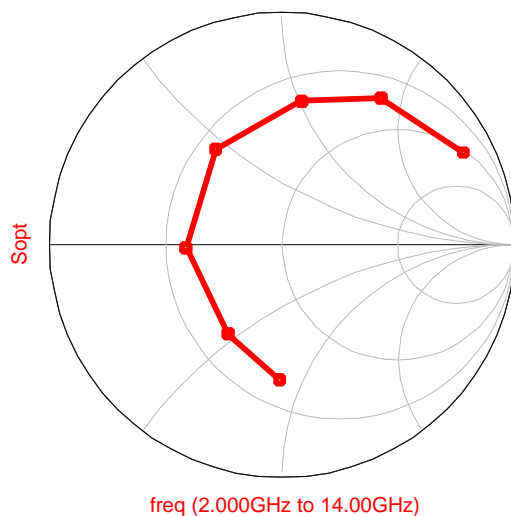
Noise figure/associated gain @ Γ_{opt}



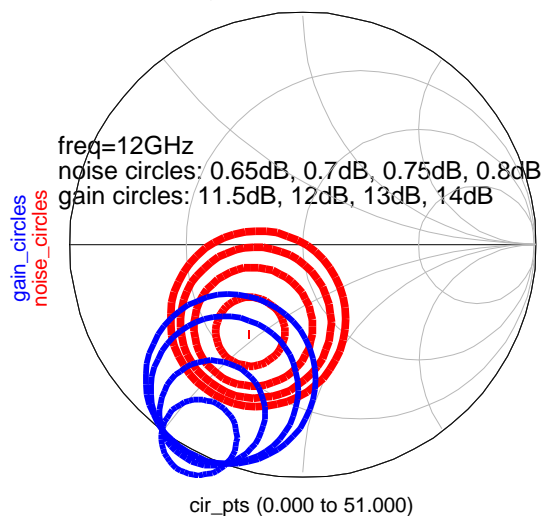
Equivalent noise resistance



Optimum source reflection coefficient



Noise and gain circles at 12GHz



Typical Measured Data CFH120-08

Common Source S – Parameters ($V_{DD}=2V$, $I_D=0mA$, $Z_0=50\Omega$)

Freq [GHz]	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.999	-13.6	0.041	102.3	0.036	74.7	0.989	-11.4
1.5	0.993	-18.1	0.051	93.6	0.047	70.1	0.988	-15.6
2.0	0.986	-24.4	0.066	83.1	0.062	65.4	0.988	-21.4
2.5	0.985	-30.4	0.082	73.9	0.079	60.0	0.987	-27.1
3.0	0.977	-36.4	0.098	65.6	0.095	54.2	0.981	-32.9
3.5	0.980	-43.1	0.114	58.0	0.111	47.8	0.977	-38.7
4.0	0.979	-49.9	0.130	50.3	0.128	42.0	0.973	-44.4
4.5	0.972	-56.4	0.146	43.2	0.145	35.6	0.973	-50.3
5.0	0.963	-62.6	0.163	36.6	0.162	29.0	0.973	-56.8
5.5	0.958	-68.8	0.181	30.0	0.179	22.3	0.966	-63.3
6.0	0.957	-75.1	0.200	23.0	0.195	16.0	0.956	-70.0
6.5	0.950	-82.2	0.220	15.8	0.213	9.4	0.945	-76.7
7.0	0.938	-90.3	0.239	7.7	0.233	2.4	0.938	-83.7
7.5	0.923	-98.9	0.256	-1.0	0.252	-5.8	0.937	-91.7
8.0	0.913	-107.3	0.271	-9.3	0.271	-14.7	0.933	-100.5
8.5	0.907	-115.7	0.286	-17.8	0.286	-23.9	0.924	-109.5
9.0	0.906	-124.3	0.304	-26.8	0.299	-32.6	0.905	-118.5
9.5	0.901	-133.7	0.319	-36.2	0.309	-41.3	0.891	-127.5
10.0	0.888	-143.9	0.328	-46.0	0.321	-50.5	0.888	-137.4
10.5	0.873	-154.6	0.333	-56.4	0.331	-60.7	0.890	-148.1
11.0	0.861	-165.3	0.333	-67.0	0.334	-72.2	0.886	-160.2
11.5	0.862	-176.1	0.333	-77.8	0.328	-83.8	0.875	-172.6
12.0	0.872	172.7	0.327	-89.0	0.316	-94.8	0.871	175.2
12.5	0.884	161.3	0.311	-100.3	0.300	-105.2	0.879	163.7
13.0	0.884	150.7	0.288	-110.9	0.281	-115.3	0.897	152.8
13.5	0.877	141.4	0.265	-120.1	0.263	-125.2	0.913	142.2
14.0	0.877	132.6	0.245	-128.8	0.243	-135.3	0.913	131.9
14.5	0.888	123.0	0.228	-137.6	0.220	-144.7	0.909	121.8
15.0	0.902	112.1	0.210	-147.4	0.198	-153.6	0.914	111.9
15.5	0.904	100.6	0.186	-158.0	0.179	-162.9	0.929	101.8
16.0	0.899	90.0	0.160	-167.8	0.159	-172.8	0.936	91.4
16.5	0.894	81.8	0.135	-175.1	0.136	177.5	0.943	81.8
17.0	0.902	75.4	0.116	179.2	0.113	169.7	0.950	74.0
17.5	0.926	68.8	0.101	173.3	0.093	164.1	0.951	67.9
18.0	0.949	63.7	0.093	168.1	0.082	160.7	0.961	64.3

Typical Measured Data CFH120-08

Common Source S – Parameters ($V_{DD}=2V$, $I_D=5mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.984	-19.7	3.859	161.1	0.029	75.6	0.719	-14.5
1.5	0.974	-25.8	3.845	155.1	0.037	69.2	0.711	-19.6
2.0	0.962	-34.6	3.836	146.7	0.048	62.1	0.699	-26.9
2.5	0.949	-43.4	3.836	138.5	0.060	55.8	0.683	-34.3
3.0	0.934	-52.3	3.825	130.2	0.070	49.1	0.663	-41.4
3.5	0.923	-61.5	3.829	121.5	0.081	42.6	0.642	-48.6
4.0	0.904	-70.9	3.817	113.0	0.091	35.9	0.619	-55.7
4.5	0.883	-80.0	3.773	104.5	0.100	29.3	0.595	-63.1
5.0	0.858	-88.7	3.747	96.2	0.109	22.2	0.570	-71.1
5.5	0.833	-97.8	3.740	88.0	0.117	15.8	0.539	-79.0
6.0	0.807	-107.5	3.742	79.4	0.124	9.3	0.504	-87.4
6.5	0.777	-118.1	3.725	70.6	0.131	2.7	0.466	-96.5
7.0	0.746	-129.5	3.663	61.4	0.136	-4.4	0.430	-106.6
7.5	0.715	-141.2	3.572	52.2	0.139	-11.5	0.396	-117.4
8.0	0.691	-152.2	3.489	43.4	0.142	-18.4	0.362	-128.9
8.5	0.670	-163.4	3.418	34.7	0.142	-25.2	0.332	-140.8
9.0	0.651	-174.9	3.356	25.7	0.142	-31.7	0.306	-153.4
9.5	0.632	173.1	3.271	16.8	0.140	-37.8	0.285	-167.1
10.0	0.615	161.2	3.158	8.2	0.138	-43.9	0.272	177.7
10.5	0.605	149.3	3.030	-0.1	0.136	-49.9	0.269	162.2
11.0	0.604	138.0	2.914	-8.5	0.132	-55.7	0.271	146.3
11.5	0.611	127.2	2.810	-16.9	0.125	-61.1	0.283	132.0
12.0	0.620	117.1	2.686	-25.2	0.119	-65.9	0.304	119.8
12.5	0.628	108.4	2.541	-33.0	0.114	-69.9	0.332	111.1
13.0	0.629	100.8	2.403	-39.9	0.109	-73.3	0.358	104.2
13.5	0.630	94.1	2.296	-46.4	0.104	-76.9	0.378	98.0
14.0	0.639	87.1	2.229	-53.1	0.100	-80.7	0.392	91.3
14.5	0.655	78.9	2.167	-60.6	0.095	-83.9	0.408	84.0
15.0	0.671	69.8	2.080	-68.7	0.091	-86.7	0.435	76.3
15.5	0.682	61.5	1.958	-76.3	0.087	-89.9	0.471	69.1
16.0	0.693	55.0	1.828	-83.2	0.082	-93.1	0.506	62.6
16.5	0.706	50.2	1.719	-88.7	0.077	-95.6	0.528	57.5
17.0	0.730	46.1	1.665	-94.1	0.073	-97.3	0.538	53.2
17.5	0.756	41.4	1.629	-100.3	0.069	-97.9	0.551	49.3
18.0	0.772	37.5	1.609	-105.3	0.068	-98.1	0.567	46.5

Typical Measured Data CFH120-08

Common Source S – Parameters ($V_{DD}=2V$, $I_D=10mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.983	-21.1	5.110	160.0	0.027	74.1	0.666	-15.9
1.5	0.968	-27.7	5.041	153.6	0.035	67.8	0.655	-21.0
2.0	0.951	-37.1	4.989	144.8	0.046	61.0	0.639	-28.5
2.5	0.937	-46.3	4.965	136.2	0.056	54.8	0.623	-35.9
3.0	0.918	-55.5	4.928	127.5	0.066	48.4	0.601	-43.4
3.5	0.897	-65.4	4.897	118.4	0.075	41.7	0.576	-50.7
4.0	0.871	-75.4	4.832	109.3	0.084	35.1	0.546	-58.4
4.5	0.844	-85.0	4.749	100.9	0.093	28.7	0.519	-66.1
5.0	0.815	-94.3	4.668	92.6	0.100	22.1	0.490	-74.0
5.5	0.786	-103.8	4.602	84.3	0.106	15.9	0.457	-81.8
6.0	0.756	-114.1	4.555	75.7	0.111	10.0	0.421	-90.4
6.5	0.723	-125.1	4.483	66.7	0.116	3.9	0.383	-100.2
7.0	0.690	-137.0	4.365	57.8	0.120	-2.4	0.345	-110.9
7.5	0.662	-149.0	4.220	49.0	0.122	-8.9	0.310	-122.4
8.0	0.643	-160.5	4.093	40.5	0.124	-15.1	0.279	-134.6
8.5	0.626	-171.8	3.975	31.9	0.125	-21.2	0.252	-147.4
9.0	0.609	176.5	3.867	23.3	0.125	-27.0	0.229	-161.6
9.5	0.595	164.7	3.727	14.9	0.123	-32.1	0.216	-177.2
10.0	0.582	152.9	3.565	6.8	0.122	-37.4	0.211	165.8
10.5	0.580	141.5	3.417	-1.3	0.120	-42.5	0.217	148.7
11.0	0.585	130.8	3.303	-9.1	0.118	-47.6	0.230	132.7
11.5	0.596	120.3	3.175	-16.9	0.114	-52.2	0.250	118.8
12.0	0.609	110.6	3.019	-24.8	0.110	-55.9	0.277	108.0
12.5	0.618	102.3	2.860	-32.3	0.107	-59.2	0.306	100.0
13.0	0.623	95.3	2.709	-38.7	0.104	-62.5	0.332	93.9
13.5	0.626	88.9	2.601	-44.8	0.101	-65.7	0.350	88.6
14.0	0.635	82.1	2.521	-51.2	0.099	-69.0	0.365	82.6
14.5	0.654	74.2	2.449	-58.4	0.096	-72.0	0.383	75.8
15.0	0.670	65.7	2.361	-66.2	0.094	-74.6	0.411	68.6
15.5	0.681	58.0	2.232	-73.4	0.091	-77.8	0.447	62.0
16.0	0.688	51.9	2.094	-79.9	0.088	-81.5	0.482	56.1
16.5	0.704	47.5	1.982	-85.2	0.083	-84.8	0.504	51.4
17.0	0.728	43.6	1.922	-90.5	0.080	-86.9	0.513	47.7
17.5	0.752	39.0	1.885	-96.5	0.078	-87.9	0.525	44.2
18.0	0.768	35.3	1.865	-101.4	0.077	-88.4	0.539	41.4

Typical Measured Data CFH120-08

Common Source S – Parameters ($V_{DD}=2V$, $I_D=15mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.977	-21.8	5.836	159.1	0.026	73.6	0.647	-16.2
1.5	0.963	-28.7	5.771	152.7	0.034	67.0	0.634	-21.6
2.0	0.944	-38.4	5.703	143.7	0.044	60.8	0.615	-29.4
2.5	0.928	-47.9	5.666	134.8	0.055	54.7	0.597	-37.0
3.0	0.905	-57.4	5.597	126.0	0.064	48.0	0.572	-44.5
3.5	0.883	-67.6	5.517	116.9	0.073	41.5	0.543	-52.2
4.0	0.854	-77.7	5.425	107.8	0.081	35.2	0.514	-59.9
4.5	0.825	-87.7	5.304	99.0	0.088	28.8	0.486	-67.4
5.0	0.796	-97.1	5.192	90.7	0.095	22.3	0.456	-75.5
5.5	0.766	-106.9	5.101	82.3	0.101	16.4	0.422	-83.7
6.0	0.733	-117.2	5.027	73.7	0.105	10.3	0.383	-92.9
6.5	0.699	-128.6	4.931	64.8	0.110	4.2	0.344	-103.1
7.0	0.667	-140.7	4.771	55.9	0.114	-2.3	0.307	-114.2
7.5	0.639	-152.6	4.601	47.5	0.117	-8.3	0.273	-126.1
8.0	0.618	-164.1	4.439	39.2	0.119	-14.0	0.245	-139.1
8.5	0.601	-175.2	4.302	30.6	0.119	-19.4	0.224	-153.0
9.0	0.586	173.1	4.181	22.0	0.118	-24.9	0.207	-168.2
9.5	0.574	161.2	4.023	13.8	0.118	-29.5	0.198	175.0
10.0	0.564	149.4	3.842	5.9	0.117	-34.9	0.200	156.9
10.5	0.565	138.1	3.674	-1.8	0.116	-39.8	0.212	139.7
11.0	0.571	127.4	3.531	-9.3	0.115	-44.6	0.230	124.4
11.5	0.584	116.9	3.385	-17.2	0.111	-49.2	0.254	111.7
12.0	0.599	107.4	3.227	-24.9	0.108	-52.9	0.284	101.7
12.5	0.608	99.2	3.050	-32.1	0.106	-56.0	0.314	94.8
13.0	0.612	92.3	2.884	-38.4	0.103	-59.4	0.339	89.8
13.5	0.617	86.0	2.770	-44.4	0.102	-62.5	0.356	84.9
14.0	0.628	79.2	2.691	-50.8	0.099	-65.9	0.370	79.3
14.5	0.644	71.3	2.620	-57.9	0.096	-68.7	0.388	72.8
15.0	0.661	62.8	2.527	-65.4	0.094	-72.1	0.416	65.9
15.5	0.672	55.2	2.386	-72.6	0.093	-75.6	0.452	59.6
16.0	0.683	49.1	2.236	-79.0	0.090	-79.4	0.486	54.2
16.5	0.698	44.7	2.119	-84.2	0.086	-82.5	0.505	50.0
17.0	0.721	41.0	2.064	-89.3	0.083	-84.7	0.513	46.3
17.5	0.745	36.2	2.028	-95.4	0.080	-85.7	0.524	42.8
18.0	0.761	32.2	2.005	-100.0	0.079	-85.7	0.536	40.2

Typical Measured Data CFH120-08

Common Source S – Parameters ($V_{DD}=2V$, $I_D=20mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.980	-22.7	6.342	158.6	0.026	70.0	0.637	-16.5
1.5	0.961	-29.5	6.265	152.1	0.033	66.4	0.626	-22.1
2.0	0.943	-39.2	6.183	143.0	0.044	61.0	0.609	-30.0
2.5	0.925	-49.0	6.113	134.1	0.054	54.6	0.588	-37.5
3.0	0.901	-58.7	6.025	125.1	0.063	47.7	0.563	-45.3
3.5	0.875	-68.9	5.934	115.9	0.071	41.3	0.536	-52.7
4.0	0.842	-79.4	5.804	106.9	0.078	35.0	0.503	-60.3
4.5	0.813	-89.2	5.654	98.2	0.085	29.1	0.471	-68.1
5.0	0.782	-98.7	5.522	89.7	0.092	23.2	0.441	-76.3
5.5	0.751	-108.4	5.408	81.3	0.097	17.1	0.407	-84.4
6.0	0.719	-118.7	5.316	72.9	0.102	11.2	0.368	-93.5
6.5	0.686	-129.9	5.188	64.2	0.106	5.2	0.330	-103.8
7.0	0.650	-142.0	5.015	55.4	0.109	-1.0	0.292	-114.7
7.5	0.619	-153.8	4.819	46.9	0.112	-7.2	0.258	-125.8
8.0	0.599	-164.9	4.645	38.8	0.114	-12.6	0.232	-138.5
8.5	0.581	-176.1	4.504	30.6	0.115	-17.9	0.216	-153.6
9.0	0.568	172.2	4.382	22.1	0.116	-23.0	0.202	-169.7
9.5	0.554	160.3	4.222	13.8	0.115	-27.7	0.198	172.8
10.0	0.545	148.3	4.036	5.9	0.114	-32.7	0.201	154.9
10.5	0.545	136.6	3.862	-1.7	0.114	-38.1	0.215	138.2
11.0	0.553	125.6	3.709	-9.2	0.112	-42.6	0.233	123.1
11.5	0.568	115.1	3.552	-17.0	0.109	-46.9	0.258	110.8
12.0	0.583	105.4	3.383	-24.6	0.107	-50.5	0.289	101.4
12.5	0.593	97.1	3.207	-31.6	0.104	-53.8	0.319	94.7
13.0	0.597	89.9	3.037	-38.0	0.103	-57.5	0.344	89.6
13.5	0.601	83.5	2.923	-43.9	0.101	-60.6	0.362	84.9
14.0	0.611	76.4	2.839	-50.2	0.099	-64.2	0.375	79.6
14.5	0.629	68.2	2.764	-57.3	0.097	-67.4	0.393	73.4
15.0	0.647	59.5	2.655	-64.9	0.095	-70.8	0.422	66.7
15.5	0.660	51.7	2.509	-71.9	0.095	-74.2	0.458	60.7
16.0	0.673	45.7	2.351	-78.2	0.092	-77.9	0.490	55.0
16.5	0.690	41.2	2.233	-83.4	0.088	-81.0	0.509	50.8
17.0	0.715	37.1	2.176	-88.6	0.084	-83.5	0.517	47.4
17.5	0.738	32.2	2.144	-94.7	0.082	-85.1	0.526	44.0
18.0	0.753	28.2	2.114	-99.5	0.082	-85.6	0.539	41.3

Typical Measured Data CFH120-10

Common Source S – Parameters ($V_{DD}=2V$, $I_D=0mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.898	-13.9	0.067	24.5	0.065	26.1	0.957	-12.4
1.5	0.891	-17.9	0.074	27.9	0.073	28.6	0.956	-16.1
2.0	0.884	-23.5	0.086	30.6	0.087	30.3	0.954	-21.5
2.5	0.881	-29.5	0.102	31.0	0.102	30.2	0.953	-27.2
3.0	0.878	-35.7	0.120	29.3	0.119	28.3	0.945	-32.9
3.5	0.874	-42.0	0.138	26.3	0.136	25.7	0.938	-38.5
4.0	0.868	-48.6	0.156	22.1	0.155	22.3	0.931	-44.5
4.5	0.861	-55.0	0.175	17.5	0.174	17.9	0.928	-50.7
5.0	0.853	-61.2	0.195	12.6	0.195	13.0	0.924	-57.1
5.5	0.846	-67.2	0.216	7.5	0.215	7.5	0.917	-63.7
6.0	0.836	-73.4	0.239	2.0	0.236	1.9	0.901	-70.5
6.5	0.823	-80.4	0.263	-4.6	0.258	-4.2	0.888	-77.6
7.0	0.809	-88.1	0.285	-11.8	0.281	-11.0	0.875	-85.3
7.5	0.794	-96.4	0.306	-19.5	0.306	-18.5	0.864	-93.7
8.0	0.781	-104.9	0.327	-27.6	0.329	-26.8	0.851	-102.8
8.5	0.769	-113.4	0.349	-35.7	0.349	-35.3	0.837	-112.3
9.0	0.761	-122.2	0.371	-44.4	0.368	-43.9	0.820	-122.1
9.5	0.749	-131.6	0.391	-53.6	0.385	-52.9	0.808	-132.3
10.0	0.738	-141.6	0.405	-63.3	0.401	-62.3	0.800	-143.1
10.5	0.726	-152.3	0.415	-73.6	0.414	-72.6	0.791	-154.5
11.0	0.718	-163.2	0.420	-84.0	0.420	-83.4	0.783	-166.8
11.5	0.720	-174.7	0.420	-94.9	0.417	-94.3	0.778	-179.5
12.0	0.727	173.5	0.414	-105.8	0.408	-105.2	0.784	167.9
12.5	0.743	161.7	0.402	-116.7	0.395	-115.6	0.801	156.2
13.0	0.755	150.4	0.383	-127.3	0.380	-125.8	0.823	145.2
13.5	0.763	139.8	0.360	-137.2	0.361	-136.1	0.840	134.8
14.0	0.772	129.6	0.340	-146.7	0.340	-146.1	0.849	124.6
14.5	0.783	118.9	0.321	-156.3	0.317	-156.0	0.856	114.5
15.0	0.797	107.6	0.300	-166.5	0.295	-165.8	0.871	104.6
15.5	0.808	96.0	0.275	-176.8	0.273	-175.5	0.900	94.7
16.0	0.818	85.3	0.247	173.3	0.250	174.8	0.927	85.1
16.5	0.830	76.5	0.220	164.8	0.224	165.5	0.940	76.7
17.0	0.847	68.7	0.197	157.3	0.198	157.3	0.939	69.6
17.5	0.868	61.8	0.181	150.8	0.176	151.1	0.938	63.8
18.0	0.890	56.9	0.174	145.7	0.164	147.4	0.942	60.3

Typical Measured Data CFH120-10

Common Source S – Parameters ($V_{DD}=2V$, $I_D=5mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.982	-22.2	4.059	158.7	0.037	72.8	0.732	-17.0
1.5	0.968	-28.3	3.994	153.0	0.046	66.1	0.720	-22.2
2.0	0.953	-37.0	3.942	144.7	0.059	58.9	0.705	-29.4
2.5	0.940	-46.5	3.936	135.9	0.073	52.0	0.685	-37.4
3.0	0.924	-56.4	3.939	126.8	0.087	44.8	0.663	-45.3
3.5	0.904	-66.5	3.933	117.9	0.100	37.8	0.638	-53.3
4.0	0.883	-77.0	3.918	108.7	0.112	30.6	0.609	-61.7
4.5	0.862	-87.2	3.883	99.8	0.124	23.4	0.579	-70.1
5.0	0.836	-97.4	3.848	90.7	0.134	16.1	0.546	-79.0
5.5	0.809	-107.9	3.822	81.7	0.143	8.9	0.508	-88.4
6.0	0.777	-119.1	3.801	72.4	0.151	1.7	0.467	-98.8
6.5	0.744	-131.4	3.741	62.9	0.158	-5.9	0.424	-110.1
7.0	0.712	-144.3	3.658	53.3	0.163	-13.5	0.383	-122.6
7.5	0.684	-157.2	3.544	43.8	0.166	-21.4	0.346	-136.2
8.0	0.663	-170.1	3.428	34.4	0.168	-29.2	0.315	-150.7
8.5	0.645	177.3	3.327	25.0	0.168	-36.7	0.292	-166.4
9.0	0.629	164.6	3.215	15.7	0.166	-43.7	0.278	177.1
9.5	0.616	152.1	3.087	6.7	0.164	-50.6	0.275	160.4
10.0	0.609	140.0	2.941	-2.1	0.160	-57.2	0.279	144.2
10.5	0.608	128.4	2.790	-10.5	0.155	-63.7	0.291	129.2
11.0	0.614	117.4	2.661	-18.9	0.148	-70.1	0.308	115.9
11.5	0.624	107.0	2.527	-27.1	0.141	-76.0	0.331	104.6
12.0	0.632	97.6	2.395	-35.0	0.134	-81.0	0.358	95.8
12.5	0.641	89.6	2.259	-42.4	0.127	-85.8	0.385	89.1
13.0	0.643	82.6	2.133	-49.2	0.121	-90.0	0.408	83.4
13.5	0.648	76.0	2.032	-55.7	0.115	-94.6	0.425	78.0
14.0	0.660	68.9	1.951	-62.5	0.109	-99.2	0.440	72.0
14.5	0.675	61.3	1.871	-69.7	0.104	-103.7	0.459	65.6
15.0	0.688	53.5	1.783	-77.3	0.099	-107.9	0.487	59.3
15.5	0.699	46.4	1.673	-84.4	0.093	-112.1	0.518	53.5
16.0	0.709	40.8	1.565	-90.8	0.087	-116.3	0.546	48.5
16.5	0.723	36.6	1.480	-96.4	0.081	-120.2	0.561	44.5
17.0	0.742	32.5	1.420	-102.0	0.075	-123.2	0.569	40.9
17.5	0.762	28.2	1.388	-107.7	0.071	-125.2	0.580	37.6
18.0	0.779	24.8	1.376	-112.4	0.069	-126.3	0.590	35.2

Typical Measured Data CFH120-10

Common Source S – Parameters ($V_{DD}=2V$, $I_D=10mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.978	-23.2	5.240	158.3	0.035	74.9	0.686	-17.8
1.5	0.964	-30.1	5.179	151.9	0.044	67.0	0.673	-23.5
2.0	0.950	-40.2	5.127	142.6	0.057	59.1	0.655	-31.9
2.5	0.936	-50.3	5.107	133.5	0.069	51.9	0.634	-40.1
3.0	0.914	-60.6	5.070	124.1	0.082	44.4	0.606	-48.5
3.5	0.889	-71.5	5.028	114.8	0.094	37.3	0.574	-57.0
4.0	0.862	-82.8	4.960	105.3	0.106	30.4	0.540	-65.7
4.5	0.834	-93.5	4.848	96.0	0.115	23.1	0.505	-74.8
5.0	0.805	-104.0	4.748	86.8	0.123	15.7	0.469	-84.5
5.5	0.775	-115.0	4.668	77.6	0.130	8.6	0.428	-94.6
6.0	0.745	-127.0	4.611	68.3	0.137	1.6	0.387	-105.8
6.5	0.713	-139.7	4.511	59.0	0.142	-5.8	0.345	-118.7
7.0	0.682	-153.0	4.342	49.5	0.146	-12.9	0.308	-133.2
7.5	0.654	-166.0	4.148	40.1	0.148	-20.1	0.277	-148.8
8.0	0.637	-178.7	3.990	31.2	0.149	-27.3	0.255	-165.5
8.5	0.623	168.7	3.837	22.3	0.148	-34.2	0.242	177.1
9.0	0.612	156.0	3.688	13.2	0.147	-40.4	0.241	159.5
9.5	0.604	143.5	3.514	4.6	0.145	-46.4	0.251	142.6
10.0	0.600	131.8	3.323	-3.8	0.142	-52.4	0.270	127.0
10.5	0.604	120.8	3.145	-11.6	0.137	-58.7	0.292	113.4
11.0	0.614	110.7	2.995	-19.3	0.132	-64.3	0.315	101.5
11.5	0.629	100.7	2.849	-27.3	0.125	-69.2	0.340	91.8
12.0	0.641	91.7	2.692	-35.0	0.121	-73.6	0.371	84.5
12.5	0.648	83.9	2.524	-42.1	0.116	-77.6	0.399	79.0
13.0	0.649	77.5	2.376	-48.3	0.112	-81.5	0.420	74.5
13.5	0.654	71.5	2.273	-54.3	0.109	-85.8	0.434	69.4
14.0	0.666	64.7	2.187	-60.8	0.104	-89.9	0.447	63.9
14.5	0.685	57.1	2.113	-68.0	0.100	-93.7	0.465	58.1
15.0	0.700	49.1	2.018	-75.5	0.096	-97.4	0.493	52.0
15.5	0.708	42.0	1.884	-82.4	0.092	-101.4	0.527	46.7
16.0	0.715	36.7	1.754	-88.4	0.087	-105.6	0.553	41.9
16.5	0.727	33.2	1.658	-93.2	0.081	-109.7	0.564	38.1
17.0	0.747	29.9	1.618	-98.3	0.076	-112.3	0.565	35.1
17.5	0.768	24.9	1.586	-104.5	0.073	-113.8	0.573	31.7
18.0	0.785	20.9	1.561	-109.4	0.070	-114.5	0.589	28.9

Typical Measured Data CFH120-10

Common Source S – Parameters ($V_{DD}=2V$, $I_D=15mA$, $Z_0=50\Omega$)

Freq [GHz]	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.977	-23.7	6.164	157.3	0.033	72.0	0.663	-18.4
1.5	0.959	-31.1	5.990	150.8	0.043	66.2	0.650	-24.5
2.0	0.941	-41.6	5.916	141.3	0.056	59.4	0.631	-33.2
2.5	0.924	-52.0	5.856	132.1	0.068	51.3	0.606	-41.8
3.0	0.901	-62.5	5.780	122.7	0.079	43.8	0.576	-50.6
3.5	0.876	-73.8	5.709	112.9	0.091	36.8	0.544	-59.4
4.0	0.844	-85.3	5.588	103.3	0.100	30.0	0.508	-68.3
4.5	0.812	-96.3	5.428	94.0	0.108	22.9	0.471	-77.7
5.0	0.780	-107.2	5.296	84.8	0.116	15.2	0.434	-87.8
5.5	0.750	-118.3	5.170	75.9	0.123	8.3	0.394	-98.1
6.0	0.717	-130.3	5.064	66.7	0.130	1.4	0.351	-109.8
6.5	0.684	-143.0	4.926	57.3	0.135	-5.3	0.311	-123.8
7.0	0.654	-156.5	4.722	47.9	0.137	-12.4	0.276	-139.3
7.5	0.632	-169.6	4.486	38.6	0.139	-19.3	0.250	-156.3
8.0	0.617	177.8	4.296	30.0	0.139	-26.0	0.233	-174.2
8.5	0.605	165.2	4.121	21.2	0.140	-32.2	0.227	167.7
9.0	0.595	152.5	3.949	12.3	0.138	-38.2	0.233	150.0
9.5	0.589	140.2	3.753	3.8	0.137	-44.3	0.252	133.8
10.0	0.588	128.6	3.535	-4.3	0.135	-50.0	0.275	119.3
10.5	0.594	117.9	3.351	-12.1	0.131	-55.6	0.299	106.6
11.0	0.605	107.8	3.186	-19.5	0.126	-60.9	0.325	95.6
11.5	0.623	98.1	3.021	-27.3	0.121	-65.7	0.352	86.9
12.0	0.638	89.3	2.851	-34.8	0.117	-69.6	0.382	80.1
12.5	0.645	81.8	2.672	-41.8	0.113	-73.4	0.410	74.9
13.0	0.647	75.5	2.525	-47.8	0.109	-77.2	0.430	70.5
13.5	0.651	69.5	2.419	-53.6	0.105	-81.2	0.444	65.8
14.0	0.664	62.9	2.335	-59.9	0.101	-85.4	0.455	60.4
14.5	0.684	55.5	2.253	-66.9	0.098	-89.1	0.474	54.6
15.0	0.698	47.8	2.151	-74.1	0.095	-92.5	0.503	48.9
15.5	0.707	40.8	2.013	-81.0	0.092	-96.8	0.536	43.5
16.0	0.713	35.6	1.881	-86.8	0.087	-101.2	0.561	38.8
16.5	0.725	32.1	1.784	-91.7	0.081	-104.7	0.571	35.1
17.0	0.746	28.7	1.738	-96.5	0.077	-107.4	0.570	32.3
17.5	0.770	24.0	1.704	-102.6	0.073	-109.5	0.577	29.1
18.0	0.786	19.9	1.685	-107.7	0.072	-110.7	0.591	26.3

Typical Measured Data CFH120-10

Common Source S – Parameters ($V_{DD}=2V$, $I_D=20mA$, $Z_0=50\Omega$)

Freq [GHz]	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Phase	Mag	Phase	Mag	Phase	Mag	Phase
1.0	0.978	-24.1	6.570	156.9	0.032	70.1	0.660	-18.9
1.5	0.960	-31.8	6.485	150.3	0.041	64.6	0.644	-25.2
2.0	0.940	-42.6	6.389	140.7	0.055	57.8	0.623	-34.0
2.5	0.920	-53.2	6.317	131.2	0.067	51.3	0.599	-42.9
3.0	0.889	-63.9	6.217	121.7	0.077	44.0	0.567	-51.6
3.5	0.862	-75.2	6.116	112.1	0.089	36.8	0.532	-60.7
4.0	0.832	-86.6	5.972	102.5	0.098	29.9	0.495	-69.9
4.5	0.799	-97.8	5.793	93.0	0.106	23.1	0.458	-79.5
5.0	0.766	-108.7	5.631	83.9	0.113	15.8	0.420	-89.6
5.5	0.735	-119.9	5.498	74.9	0.119	8.9	0.378	-100.1
6.0	0.702	-131.8	5.357	65.6	0.125	2.1	0.336	-112.5
6.5	0.668	-144.8	5.204	56.2	0.130	-4.9	0.297	-127.0
7.0	0.638	-158.3	4.977	47.0	0.134	-11.7	0.265	-143.3
7.5	0.615	-171.6	4.727	38.1	0.135	-18.4	0.242	-160.5
8.0	0.601	175.8	4.511	29.5	0.135	-24.7	0.227	-178.9
8.5	0.590	163.3	4.310	20.9	0.135	-30.8	0.225	162.9
9.0	0.583	150.7	4.125	12.1	0.133	-37.0	0.235	145.4
9.5	0.578	138.5	3.920	3.8	0.132	-42.8	0.255	129.9
10.0	0.579	127.2	3.703	-4.2	0.129	-48.3	0.280	116.1
10.5	0.586	116.6	3.501	-11.8	0.127	-53.6	0.305	103.9
11.0	0.598	106.8	3.328	-19.3	0.123	-58.8	0.331	93.3
11.5	0.614	96.9	3.162	-26.9	0.119	-63.3	0.359	84.7
12.0	0.629	88.2	2.979	-34.1	0.115	-67.3	0.390	78.1
12.5	0.638	80.7	2.791	-40.9	0.111	-71.0	0.418	73.1
13.0	0.642	74.6	2.637	-46.7	0.108	-74.9	0.438	68.9
13.5	0.650	68.6	2.528	-52.5	0.105	-78.9	0.451	64.3
14.0	0.664	62.0	2.437	-58.8	0.101	-83.2	0.462	59.0
14.5	0.682	54.7	2.348	-65.7	0.098	-86.8	0.479	53.2
15.0	0.697	47.1	2.243	-72.9	0.095	-90.1	0.508	47.7
15.5	0.705	40.2	2.107	-79.6	0.092	-94.1	0.542	42.4
16.0	0.712	35.1	1.963	-85.3	0.087	-98.8	0.566	37.7
16.5	0.725	31.5	1.858	-89.9	0.082	-102.6	0.576	34.0
17.0	0.744	28.1	1.816	-94.9	0.078	-104.7	0.575	31.1
17.5	0.766	23.3	1.786	-100.9	0.075	-106.5	0.582	27.8
18.0	0.783	19.3	1.761	-105.9	0.073	-107.9	0.595	25.1

