TriQuint SEMICONDUCTOR

CFH 400
Preliminary Datasheet

Low-Noise, High-Linearity Packaged pHEMT FET

Description:

The CFH 400 is a high-linearity pHEMT FET that exhibits both a high intercept point and low noise figure. The device is suitable for front-end applications to 4 GHz such as PCS CDMA and UMTS receivers, base stations LNAs, and WLAN front-ends. The device achieves a noise figure as low as 0.55 dB with 15 dB associated gain at 1.8 GHz. It is packaged in a low-cost SOT343 package and is 100% DC tested before packaging/RF LAT after packaging.

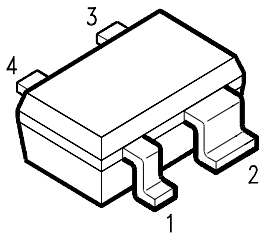
Applications:

- PCS CDMA and UMTS Receivers
- WLAN Multicarrier Receivers
- Basestations

Features:

- Low Noise figure and high associated gain for high IP3 receivers stages
- Frequencies to 4 GHz
- NF=0.55 dB; Ga=15.7 dB @ f=1.8 GHz, 3V, 10 mA
- Low cost miniature SOT343 package
- Lg = 0.4um; Wg = 400um
- Tape and reel packaging

Package Outline, SOT343:



Pin assignment:
1 = gate
2 = source
3 = drain
4 = source

Maximum Ratings:

Parameter	Symbol		Unit
Drain-source voltage	V_{DS}	5.5	V
Drain-gate voltage	V_{DG}	6.5	V
Gate-source voltage	V_{GS}	-2.0	V
Drain current	I_D	80	mA
Channel temperature	T_{Ch}	150	°C
Storage temperature range	T_{stg}	-65...+150	°C
Total power dissipation ($T_S \leq$ tbd°C) [2]	P_{tot}	150	mW
Thermal resistance			
Channel-soldering point source	R_{thChS}	166	K/W

1) Dimensions see page 4
2) T_S: Temperature measured at soldering point

Electrical characteristics:

at T_A = 25°C unless otherwise specified

Characteristics	Symbol	min	typ	max	Unit
Drain-source saturation current V_{DS} = 3 V V_{GS} = 0 V	I_{DSS}	0	40	70	mA
Pinch-off voltage V_{DS} = 3 V I_D = 1 mA	$V_{GS(P)}$	-0.7	-0.25	0	V
Gate leakage current V_{DS} = 3 V I_D = 15 mA	I_G	-	-	5	µA
Transconductance V_{DS} = 3 V I_D = 15 mA	g_m	70	100	-	mS
Noise figure* V_{DS} = 3 V I_D = 10 mA f = 1.8 GHz V_{DS} = 3 V I_D = 15 mA f = 1.8 GHz	F	-	0.55 0.53	-	dB
Associated gain* V_{DS} = 3 V I_D = 10 mA f = 1.8 GHz V_{DS} = 3 V I_D = 15 mA f = 1.8 GHz	G_a	-	15.7 16.2	-	dB
IIP3* V_{DS} = 3 V I_D = 10 mA f = 1.8 GHz V_{DS} = 3 V I_D = 15 mA f = 1.8 GHz	*IIP3*	-	6 8.5	-	dBm

* Parameters are measured at input impedance for minimum noise figure and output impedance for maximum gain.

Electrical Characteristics, Continued:

Typical Common Source S – Parameters
@ 3V; 10mA; Zo = 50Ω

f[GHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
0.2	0.9818	-6.3	8.2506	174.6	0.0128	110.7	0.7321	-5.3
0.3	0.9947	-11.8	8.3347	170.2	0.0198	91.2	0.7148	-10.4
0.4	0.9826	-17.9	8.166	164.2	0.0288	95	0.7114	-15.5
0.5	0.9696	-23.8	8.1183	159.5	0.041	72	0.6999	-20.6
0.6	0.9525	-30.1	8.0562	154.2	0.0512	71.1	0.6835	-26.1
0.7	0.9312	-36	7.9081	149.9	0.0596	66.2	0.6651	-30.8
0.8	0.9159	-41.8	7.7814	144.7	0.0666	62.8	0.6434	-36
0.9	0.8956	-47.6	7.6295	140	0.0724	58.3	0.6203	-41.1
1	0.8702	-52.9	7.4436	135	0.0799	55.5	0.5925	-46.3
1.1	0.8444	-58.7	7.2593	130.8	0.0889	51.7	0.574	-51.8
1.2	0.8144	-64.8	7.0517	126.4	0.0938	50.1	0.5488	-57.4
1.3	0.7919	-70.7	6.8482	121.8	0.0994	45.4	0.5257	-62.9
1.4	0.7663	-76	6.7195	117.8	0.1056	42.3	0.5006	-68.4
1.5	0.7438	-81.9	6.4735	114	0.1097	40.4	0.477	-73.9
1.6	0.7208	-87	6.2591	109.9	0.1124	37.2	0.4587	-79.1
1.7	0.6956	-92	6.0662	106.2	0.1158	33.9	0.4444	-85
1.8	0.6788	-97.3	5.8346	102.3	0.1195	31.6	0.4217	-90.5
1.9	0.6579	-102.6	5.6395	98.9	0.1225	30.6	0.4055	-95.2
2	0.6396	-107.5	5.4822	95.5	0.1248	27	0.3913	-101.5
2.1	0.6214	-111.8	5.3077	92.2	0.1245	24.7	0.3843	-106.5
2.2	0.6048	-116.9	5.0469	89	0.1274	23.4	0.3738	-111.7
2.3	0.5949	-121	4.8822	86.2	0.1306	21.4	0.3663	-117.1
2.4	0.5831	-125.4	4.7575	83.1	0.1313	19.1	0.3644	-121
2.5	0.5724	-129.4	4.607	80.5	0.1323	18	0.355	-126.8
3	0.5315	-147.8	3.9289	67.4	0.1364	11.5	0.3447	-145.9
3.5	0.5065	-163.5	3.4181	56	0.1396	7	0.3463	-159.9
4	0.4948	-176.1	3.0368	45.5	0.1397	1.6	0.3449	-171.5
4.5	0.4889	171.3	2.7496	35.3	0.1439	-1.8	0.3429	178
5	0.491	159.7	2.5187	25.1	0.1494	-5.7	0.3405	166.8

Typical Common Source Noise – Parameters
@ 3V; 10mA; Zo = 50Ω

f[GHz]	F_{min} [dB]	G_a [dB]	Mag (Γopt)	Phase(Γopt) [deg]	$R_n/50$
0.9	0.42	19.9	0.73	13	0.20
1.8	0.55	15.7	0.57	35	0.16
2.4	0.60	13.7	0.45	51	0.17
3.0	0.67	12.7	0.35	72	0.13
4.0	0.70	10.7	0.33	107	0.10

Electrical Characteristics, Continued:

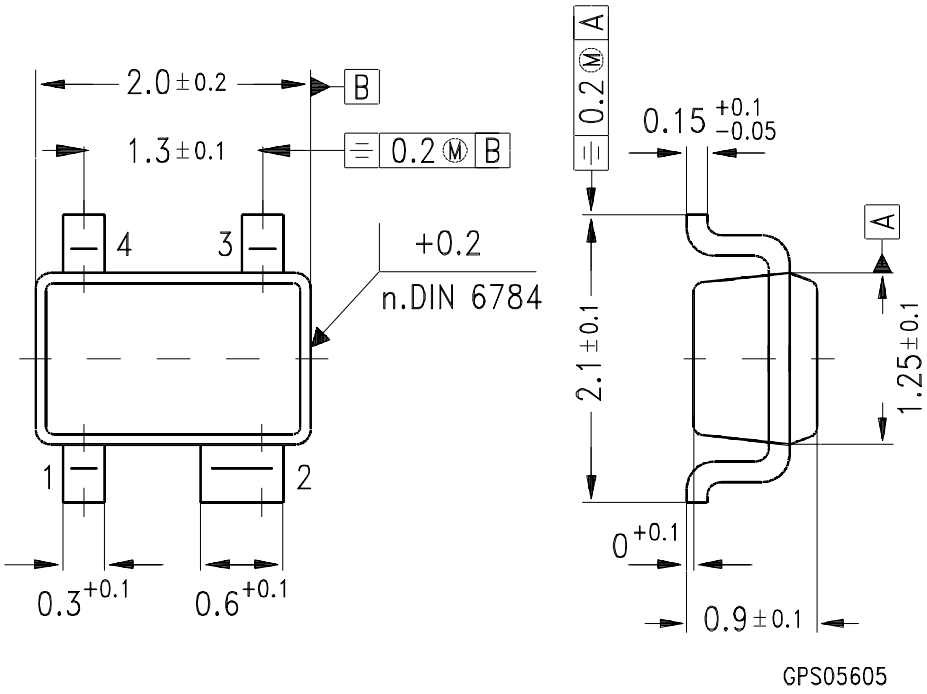
Typical Common Source S – Parameters
@ 3V; 15mA; Zo = 50Ω

f[GHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
0.2	0.9995	-4.3	9.9975	174.5	0.0168	128.9	0.6751	-6.1
0.3	0.9933	-13.3	10.0492	168.8	0.02	93.3	0.6764	-11.2
0.4	0.9788	-20.1	9.8365	163	0.0259	84.5	0.67	-16.9
0.5	0.9604	-26.7	9.7307	157.4	0.038	71.5	0.6521	-23.4
0.6	0.9348	-33.6	9.6242	151.7	0.047	68.3	0.6349	-28.9
0.7	0.9115	-40.1	9.412	147.2	0.0503	65.5	0.6091	-34.2
0.8	0.8924	-46.6	9.1204	141.8	0.0596	60.5	0.5844	-40.2
0.9	0.8721	-52.6	8.9181	136.5	0.0715	56.7	0.5641	-45.9
1	0.8457	-59	8.569	131.6	0.0769	52.3	0.5325	-51.9
1.1	0.8144	-65.1	8.3702	127.2	0.0817	49.6	0.5124	-57.4
1.2	0.788	-71.2	8.0757	122.3	0.0869	46	0.4814	-62.7
1.3	0.7555	-77.2	7.821	117.9	0.0903	44.2	0.4603	-69.1
1.4	0.7317	-83.5	7.548	114.3	0.0971	41.1	0.4369	-74.5
1.5	0.7136	-89.2	7.2741	110.1	0.1005	37.8	0.4155	-80.9
1.6	0.6862	-94.7	6.9825	106.5	0.1027	37.1	0.3947	-86.4
1.7	0.6595	-100.1	6.69	103	0.1054	34.3	0.3836	-93.2
1.8	0.6437	-105.3	6.4121	98.9	0.108	31.8	0.368	-99
1.9	0.6195	-110.4	6.1979	95.4	0.1108	29.3	0.351	-104.6
2	0.6053	-115.3	5.9347	92.5	0.1135	28.8	0.3428	-110
2.1	0.5946	-120.1	5.7644	89.3	0.1144	26.5	0.334	-116.1
2.2	0.5814	-124.6	5.5403	86	0.1146	24.6	0.3294	-121.3
2.3	0.5675	-129	5.3237	83.2	0.1167	23.6	0.3265	-125.8
2.4	0.5583	-133.5	5.1687	80.5	0.1179	22.6	0.3213	-130.9
2.5	0.5487	-137.4	4.918	78	0.1177	20.9	0.3168	-135.6
3	0.5182	-155.5	4.2195	65.3	0.125	15.1	0.3195	-154.7
3.5	0.4985	-170.8	3.6443	54.2	0.1279	10.8	0.3212	-168.6
4	0.4876	176.6	3.2225	44.4	0.1328	6.9	0.3248	-178.3
4.5	0.4873	165.8	2.9196	34.6	0.1377	3.3	0.3252	171.5
5	0.4795	153.7	2.6297	24.4	0.1436	0.5	0.3221	159.9

Typical Common Source Noise – Parameters
@ 3V; 15mA; Zo = 50Ω

f[GHz]	F_{min} [dB]	G_a [dB]	Mag (Γopt)	Phase(Γopt) [deg]	$R_n/50$
0.9	0.40	20.4	0.74	13	0.18
1.8	0.53	16.2	0.57	30	0.15
2.4	0.58	14.3	0.39	52	0.14
3.0	0.63	13.0	0.31	78	0.12
4.0	0.68	11.0	0.29	109	0.10

Semiconductor Device Outline SOT343



Pin assignment:

1 = gate
2 = source
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Ordering Information:

Type	Marking	Ordering code (taped)	Package [1]
CFH400	N4s	Q62702-G0116	SOT343

ESD: Electro**s**tatic **d**ischarge sensitive device, observe handling precautions!

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