

**Low-Noise, High-Linearity Packaged pHEMT FET**

**Product Description**

The CFH800 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 up 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 0.50 dB with 17 dB associated gain at 1.8 GHz. It is packaged in a low-cost miniature SC70 package.

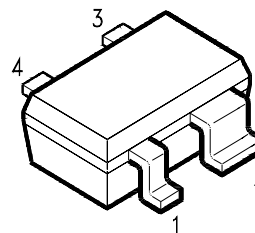
**Features**

- Low Noise figure and high associated gain for high IP3 receiver stages up to 4 GHz
- NF = 0.50dB; Ga = 17 dB @ 3V, 30 mA  
f = 1.8 GHz
- Low cost miniature package SC70
- $L_G = 0.4\mu\text{m}$ ;  $W_G = 800\mu\text{m}$

**Applications**

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

**Package Style**



**Pin assignment:**

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

## Low-Noise, High-Linearity Packaged pHEMT FET

### Absolute Maximum Ratings

Symbol	Parameter	Absolute Maximum Value	Units
$V_{DS}$	Drain-Source Voltage	5.5	V
$V_{DG}$	Drain-Gate Voltage	6.5	V
$V_{GS}$	Gate-Source Voltage	-2.0	V
$I_D$	Drain Current	160	mA
$T_{CH}$	Channel Temperature	+150	°C
$T_{SG}$	Storage Temperature	-65 to +150	°C
$P_{TOT}$	Total Power Dissipation ( $T_S \leq 80.7^\circ\text{C}$ ) <sup>1</sup>	350	mW

### Thermal Resistance

$R_{thChS}$	Channel-soldering point source	198	K/W
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Notes: 1)  $T_S$ : Temperature measured on the source lead at the soldering point to the PCB.

### Electrical Specifications

Symbol	Parameter	Conditions	Min.	Typ/Nom	Max.	Units
$I_{DSS}$	Drain-Source Saturation Current	$V_{DS} = 3V; V_{GS} = 0V$	0	80	140	mA
$V_{GS}$	Pinch-off Voltage	$V_{DS} = 3V; I_D = 1\text{ mA}$	-0.7	-0.25	0	V
$I_G$	Gate Leakage Current	$V_{DS} = 3V; I_D = 30\text{ mA}$	-	-	10	$\mu\text{A}$
$g_m$	Transconductance	$V_{DS} = 3V; I_D = 30\text{ mA}$	140	200	-	mS
F	Noise Figure*	$V_{DS} = 3V; I_D = 10\text{ mA}; f = 1.8\text{ GHz}$	-	0.56	-	dB
		$I_D = 30\text{ mA}$	-	0.50	-	dB
$G_a$	Associated Gain	$V_{DS} = 3V; I_D = 10\text{ mA}; f = 1.8\text{ GHz}$	-	15.0	-	dB
		$I_D = 30\text{ mA}$	15.0	17.0	18.0	dB
IIP3	Input 3rd Order Intercept Point	$V_{DS} = 3V; I_D = 10\text{ mA}; f = 1.8\text{ GHz}$	-	8.5	-	dBm
		$I_D = 30\text{ mA}$	-	13.0	-	dBm

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

## Low-Noise, High-Linearity Packaged pHEMT FET

### 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
0.1	0.9943	-8.9	9.4018	172.1	0.0131	85.4	0.7544	-7.1
0.2	0.9838	-18.1	9.2688	164.7	0.0270	79.3	0.7429	-13.6
0.3	0.9652	-27.0	9.0662	157.5	0.0392	73.8	0.7254	-20.3
0.4	0.9409	-35.6	8.7864	150.7	0.0516	68.2	0.6997	-26.8
0.5	0.9060	-44.4	8.4549	143.9	0.0616	63.3	0.6697	-33.0
0.6	0.8746	-52.3	8.0896	137.9	0.0707	58.4	0.6394	-38.6
0.7	0.8440	-60.1	7.7198	132.3	0.0789	54.6	0.6042	-44.2
0.8	0.8101	-67.6	7.3994	126.9	0.0866	50.8	0.5727	-49.7
0.9	0.7818	-74.1	7.0608	122.0	0.0930	47.4	0.5417	-54.7
1.0	0.7613	-81.4	6.7686	117.2	0.0991	44.1	0.5111	-59.7
1.1	0.7353	-88.1	6.4888	112.7	0.1047	41.0	0.4860	-64.5
1.2	0.7139	-94.6	6.1957	108.1	0.1093	38.3	0.4640	-69.2
1.3	0.6984	-100.6	5.9190	103.8	0.1134	35.3	0.4398	-74.0
1.4	0.6829	-106.5	5.6890	99.7	0.1170	33.0	0.4192	-77.9
1.5	0.6671	-112.3	5.4628	95.8	0.1217	30.4	0.3979	-81.9
1.6	0.6523	-118.6	5.2374	91.9	0.1244	28.6	0.3754	-86.1
1.7	0.6370	-124.0	5.0178	88.4	0.1275	25.9	0.3543	-89.5
1.8	0.6258	-129.7	4.7926	84.6	0.1289	24.0	0.3308	-93.5
1.9	0.6171	-135.2	4.6058	81.3	0.1304	22.2	0.3075	-97.1
2.0	0.6073	-140.2	4.4179	77.9	0.1327	20.6	0.2863	-100.6
2.1	0.6025	-145.4	4.2487	74.8	0.1346	19.1	0.2627	-104.7
2.2	0.6004	-149.8	4.1014	71.9	0.1363	17.3	0.2410	-109.1
2.3	0.6002	-154.2	3.9242	68.9	0.1369	15.9	0.2206	-114.3
2.4	0.5983	-158.2	3.7865	66.1	0.1381	14.3	0.2023	-120.4
2.5	0.5990	-162.2	3.6604	63.3	0.1395	12.9	0.1903	-127.1
2.6	0.6016	-165.8	3.5146	61.0	0.1410	11.9	0.1814	-134.3
2.7	0.6032	-169.3	3.4106	58.0	0.1424	11.0	0.1777	-141.7
2.8	0.6044	-172.5	3.3248	55.5	0.1440	9.7	0.1757	-148.7
2.9	0.6037	-175.9	3.2184	52.5	0.1445	8.4	0.1776	-155.2
3.0	0.6012	-179.5	3.1221	49.9	0.1458	7.5	0.1815	-162.3
3.1	0.5978	177.4	3.0186	47.2	0.1471	6.6	0.1862	-168.0
3.2	0.5957	174.2	2.9275	44.7	0.1482	5.2	0.1933	-172.8
3.3	0.5898	170.8	2.8240	42.0	0.1487	3.9	0.1994	-178.5
3.4	0.5817	167.6	2.7324	39.6	0.1489	2.9	0.2069	176.9
3.5	0.5767	164.2	2.6485	37.3	0.1504	1.6	0.2156	172.4
3.6	0.5745	161.3	2.5597	35.1	0.1498	0.8	0.2245	168.6
3.7	0.5713	158.8	2.4746	33.2	0.1497	0.0	0.2354	165.7
3.8	0.5716	156.4	2.4031	31.2	0.1491	-0.7	0.2465	163.2
3.9	0.5692	154.5	2.3333	29.7	0.1498	-1.0	0.2560	161.8
4.0	0.5676	152.1	2.2817	28.0	0.1507	-1.2	0.2645	161.2



## Low-Noise, High-Linearity Packaged pHEMT FET

### Electrical Characteristics, Continued:

Typical Common Source S – Parameters @ 3V; 30mA; Zo = 50Ω

f[GHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
0.1	0.9815	-15.0	19.9070	167.7	0.0103	83.2	0.4720	-13.0
0.2	0.9524	-29.8	19.0400	156.9	0.0202	75.1	0.4509	-24.0
0.3	0.8935	-43.6	17.8950	146.9	0.0289	69.4	0.4184	-34.9
0.4	0.8363	-56.2	16.5750	137.6	0.0369	64.0	0.3795	-44.9
0.5	0.7811	-67.9	15.2600	129.7	0.0427	60.0	0.3436	-54.6
0.6	0.7264	-77.7	13.9590	123.1	0.0478	57.2	0.3115	-62.6
0.7	0.6826	-87.5	12.8810	117.2	0.0523	54.6	0.2796	-70.4
0.8	0.6505	-96.1	11.8640	111.8	0.0576	52.6	0.2535	-79.0
0.9	0.6175	-104.1	10.9700	107.3	0.0608	50.9	0.2331	-86.6
1.0	0.5978	-111.8	10.2260	102.8	0.0651	49.2	0.2155	-95.4
1.1	0.5760	-118.7	9.5263	98.7	0.0678	47.8	0.2013	-103.7
1.2	0.5624	-125.1	8.9038	94.9	0.0715	46.6	0.1907	-110.3
1.3	0.5496	-131.5	8.3524	91.2	0.0748	45.8	0.1842	-117.3
1.4	0.5369	-136.9	7.8472	88.0	0.0782	44.5	0.1785	-123.0
1.5	0.5287	-142.5	7.4132	84.4	0.0816	43.5	0.1686	-129.6
1.6	0.5229	-147.8	6.9960	81.3	0.0847	42.6	0.1622	-137.3
1.7	0.5158	-152.9	6.6128	78.2	0.0874	41.3	0.1583	-142.9
1.8	0.5135	-157.8	6.2668	75.4	0.0909	40.5	0.1522	-150.8
1.9	0.5106	-162.2	5.9176	72.6	0.0934	40.0	0.1497	-158.4
2.0	0.5101	-166.3	5.6586	70.3	0.0960	38.8	0.1452	-165.8
2.1	0.5153	-170.3	5.3971	67.5	0.0995	38.1	0.1451	-174.8
2.2	0.5177	-173.5	5.1685	65.4	0.1028	36.7	0.1483	176.2
2.3	0.5270	-177.3	4.9164	63.1	0.1057	35.8	0.1536	168.0
2.4	0.5303	179.8	4.7029	61.0	0.1088	34.8	0.1649	161.2
2.5	0.5381	176.6	4.5269	58.7	0.1114	34.1	0.1761	156.7
2.6	0.5444	174.1	4.3579	56.5	0.1135	33.1	0.1880	153.1
2.7	0.5477	171.4	4.2071	54.4	0.1172	32.4	0.1996	148.9
2.8	0.5515	168.6	4.0544	52.0	0.1201	31.5	0.2104	146.9
2.9	0.5553	165.7	3.9152	50.0	0.1225	30.5	0.2203	144.6
3.0	0.5554	163.3	3.7664	47.9	0.1255	29.2	0.2335	142.8
3.1	0.5593	160.1	3.6389	45.8	0.1282	28.3	0.2447	142.2
3.2	0.5566	157.8	3.5122	43.8	0.1316	27.0	0.2515	140.6
3.3	0.5599	154.6	3.3918	41.8	0.1337	26.5	0.2627	139.4
3.4	0.5577	152.4	3.2702	39.7	0.1362	26.0	0.2693	138.4
3.5	0.5588	149.3	3.1628	38.0	0.1392	24.2	0.2796	136.8
3.6	0.5610	147.0	3.0633	36.4	0.1424	23.8	0.2917	136.1
3.7	0.5620	144.6	2.9650	34.8	0.1432	22.9	0.3025	136.6
3.8	0.5662	142.2	2.8831	33.4	0.1447	22.2	0.3119	136.4
3.9	0.5686	140.1	2.8008	31.8	0.1478	21.4	0.3195	137.2
4.0	0.5668	138.1	2.7505	30.5	0.1510	20.9	0.3253	137.9

For additional information and latest specifications, see our website: [www.triquint.com](http://www.triquint.com)



**Low-Noise, High-Linearity Packaged pHEMT FET**

*Electrical Characteristics, Continued:*

Typical Common Source S – Parameters @ 3V; 70mA; Z<sub>o</sub> = 50Ω

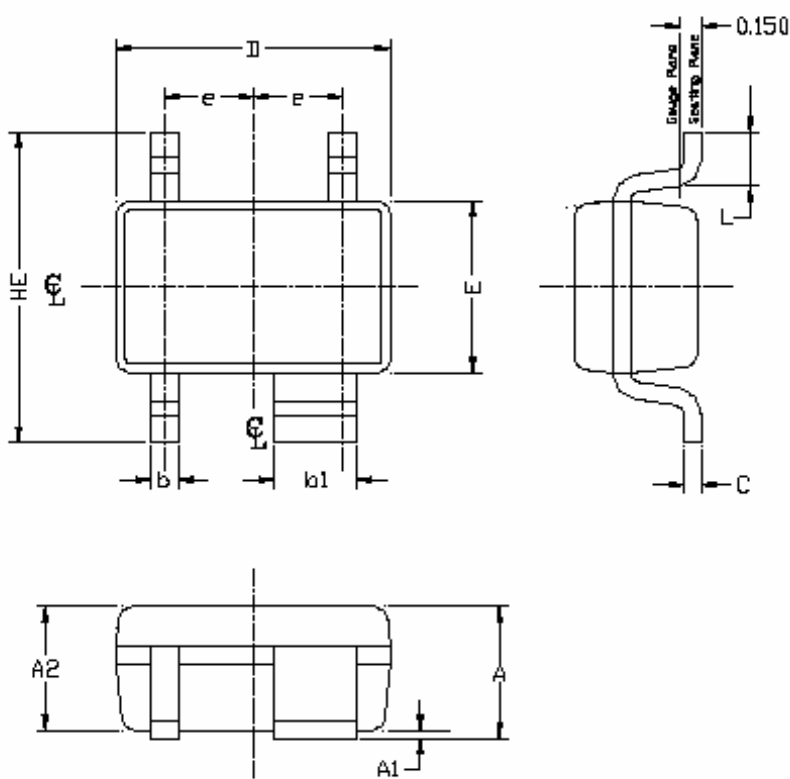
f[GHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
0.1	0.9802	-17.3	24.6950	165.4	0.0096	83.9	0.3655	-17.5
0.2	0.9367	-33.7	23.2540	153.3	0.0180	75.3	0.3424	-31.7
0.3	0.8713	-49.3	21.4050	142.2	0.0261	68.9	0.3130	-45.2
0.4	0.8054	-62.7	19.5050	132.5	0.0320	64.6	0.2821	-58.1
0.5	0.7353	-75.3	17.5720	124.3	0.0375	60.9	0.2499	-69.7
0.6	0.6821	-86.0	15.8260	117.6	0.0415	58.6	0.2253	-79.7
0.7	0.6395	-95.7	14.3120	111.8	0.0468	56.3	0.2029	-89.8
0.8	0.6028	-104.7	13.0880	106.4	0.0498	54.6	0.1875	-100.0
0.9	0.5746	-112.2	12.0040	102.0	0.0537	53.8	0.1743	-109.2
1.0	0.5536	-120.0	11.0480	97.6	0.0570	52.4	0.1660	-118.7
1.1	0.5367	-126.9	10.2570	93.7	0.0612	51.6	0.1615	-126.7
1.2	0.5215	-133.0	9.5132	89.9	0.0646	50.3	0.1582	-133.9
1.3	0.5115	-138.7	8.8582	86.6	0.0681	49.3	0.1577	-141.3
1.4	0.5030	-144.0	8.3197	83.1	0.0713	47.8	0.1535	-146.9
1.5	0.4949	-149.1	7.8187	80.0	0.0755	47.6	0.1524	-153.3
1.6	0.4917	-154.2	7.3348	77.0	0.0791	46.4	0.1508	-160.0
1.7	0.4876	-158.7	6.9477	74.4	0.0829	45.7	0.1481	-167.0
1.8	0.4874	-163.0	6.5447	71.6	0.0853	44.3	0.1488	-173.7
1.9	0.4890	-167.2	6.2151	69.2	0.0883	43.5	0.1485	178.6
2.0	0.4895	-170.8	5.9025	66.5	0.0919	42.5	0.1493	171.6
2.1	0.4932	-174.8	5.6180	64.1	0.0956	41.6	0.1522	163.5
2.2	0.4994	-177.7	5.3794	62.0	0.0986	40.7	0.1582	156.4
2.3	0.5084	179.1	5.1074	59.6	0.1021	39.3	0.1692	149.7
2.4	0.5152	176.5	4.9144	57.4	0.1054	37.9	0.1801	144.7
2.5	0.5220	173.7	4.7246	55.3	0.1085	37.1	0.1919	140.5
2.6	0.5304	171.2	4.5155	53.4	0.1113	36.2	0.2033	137.3
2.7	0.5355	169.0	4.3433	51.1	0.1151	35.1	0.2158	134.9
2.8	0.5427	166.5	4.2191	49.0	0.1185	34.1	0.2256	133.2
2.9	0.5466	163.9	4.0557	46.8	0.1214	32.7	0.2378	131.7
3.0	0.5499	161.2	3.9155	44.7	0.1250	31.8	0.2475	130.7
3.1	0.5504	158.6	3.7754	42.6	0.1285	30.6	0.2578	129.4
3.2	0.5534	156.1	3.6499	40.5	0.1307	29.2	0.2666	128.7
3.3	0.5548	153.3	3.5121	38.4	0.1337	28.0	0.2760	127.6
3.4	0.5513	150.6	3.3896	36.8	0.1369	27.1	0.2865	126.8
3.5	0.5529	147.4	3.2850	34.8	0.1390	25.3	0.2958	125.8
3.6	0.5568	145.0	3.1688	33.3	0.1415	24.7	0.3074	125.6
3.7	0.5574	142.9	3.0644	31.9	0.1429	23.6	0.3180	124.9
3.8	0.5603	140.8	2.9806	30.3	0.1454	23.1	0.3268	124.9
3.9	0.5606	139.0	2.9025	29.0	0.1479	22.0	0.3349	125.0
4.0	0.5624	136.6	2.8523	27.7	0.1520	21.4	0.3390	125.7



**Low-Noise, High-Linearity Packaged pHEMT FET**

*Packaging and Ordering Information*

SC70 4 LEAD



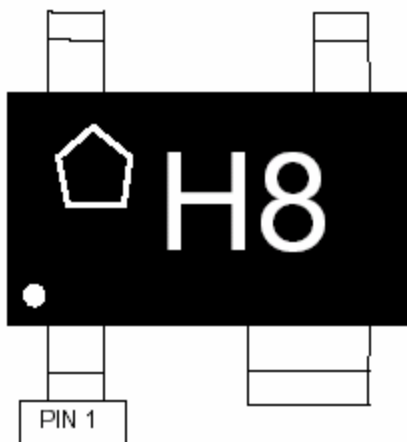
SYMBOL	MIN	MAX
E	1.15	1.35
D	1.85	2.25
HE	1.80	2.40
A	0.80	1.10
A2	0.80	1.00
A1	0.00	0.10
e	0.65 BSC	
b	0.25	0.40
b1	0.55	0.70
c	0.10	0.18
L	0.26	0.46

**Pin assignment:**

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

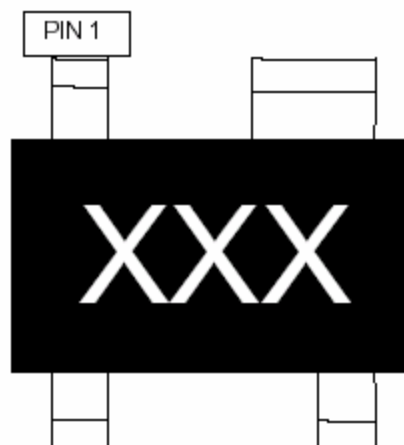
**Low-Noise, High-Linearity Packaged pHEMT FET**

TOP MARK



Top; Line 1: TriQuint Logo and "H8"

BOTTOM MARK



Bottom: Last 3 char of Lot Number

**Ordering Code (taped): CFH800**

**ESD: Electrostatic discharge sensitive device: Observe handling precautions!**

**Additional Information**<sup>1</sup>

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 1 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

<sup>1</sup> For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: [www.triquint.com](http://www.triquint.com)

Tel: (503) 615-9000

Email: [info\\_wireless@tqs.com](mailto:info_wireless@tqs.com)

Fax: (503) 615-8902

For technical questions and additional information on specific applications:

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